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FOREWORD

This report contains situation and outlook papers for the major farm inputs -- land, labor, credit and finance, machinery and structures, fertilizer, chemicals, and energy -- based on information available up to the end of October, 1989, before the release of data from the 1986 Census of Agriculture. All the papers were written by employees of the Policy Branch, Agriculture Canada. The papers were prepared as background documents for the National Agri-Food Policy Conference held in Ottawa on December 10-12, 1989.

Appreciation is extended to the many people who assisted in the preparation, review and publication of these papers. Reference material was obtained from the Regional Development offices of Agriculture Canada, other federal departments, provincial government ministries, agri-business and international and foreign sources.

Tom Wise
Outlook Coordinator for Agricultural Inputs
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FARM LABOR

A. Cho-Chung-Hing

HIGHLIGHTS

The downward trend in total agricultural employment is expected to continue in 1990. The demand for hired labor, however, will increase to offset the decline in the number of farm family members available for farm work. The 1990 supply of domestic agricultural labor should be similar to this year's level, resulting in an expanded Caribbean and Mexican Seasonal Agricultural Workers Program.

SITUATION

Total agricultural employment continues to decline. According to preliminary data from Statistics Canada's monthly Labour Force Survey, the 1989 total average annual employment (paid workers, unpaid family workers and operators) in agriculture will total 429 000 persons. This represents a decrease of 15 000 or 3.4% from last year's employment level. This decline in total employment is evident in all regions except Ontario. Total employment in Ontario increased by 5 000 from last year's weather-induced decline to reach the 1987 level of 117 000. Quebec, however, experienced a significant decrease of 12 000 from the level a year ago, while employment fell by 4 000 in the Prairie provinces and by 1 000 in British Columbia and the Atlantic provinces, respectively (Table 1).

Although total employment is on the decline, the total number and the proportion of paid workers is increasing. Between 1980 and 1989, paid workers as a proportion of total employment increased from 33 to 39%. At the same time, the proportion of unpaid family workers decreased from 17 to 9% and self-employed operators remained stable at slightly above 50%. Nationally, on a year-over-year basis, the proportion of paid workers increased by 2.5% to 165 000 in 1989, while unpaid family workers and self-employed operators decreased by 18.4% to 40 000 and by 2.6% to 224 000, respectively. Regionally, only Quebec experienced a decline in the proportion of paid workers, while the proportion of unpaid family workers fell in all regions as more farmers continued to pay wages to family members who work on the farm and as other family members obtained nonfarm jobs. The proportion of self-employed operators also fell in all regions except Ontario (Table 2).

The total farm wage bill in 1989 is expected to increase by approximately 8% over the 1988 total as a result of a combination of the increased number of hired workers and the slightly higher wage rates. The wage bill as a percentage of total farm operating expenses will remain at about last year's level of 12%, since the prices of other farm inputs are also expected to increase at marginally higher rates.

The relatively strong economy continues to provide greater nonfarm job opportunities for both farm families and workers who would normally accept farm work. In 1989, the agricultural industry, specifically the horticultural sector, increased its dependence on seasonal offshore workers to supplement the domestic supply of seasonal workers. The number of seasonal offshore workers reached 12 200, for an increase of 43% over last year's total to a level nearly double the number of such workers employed two years ago. Offshore workers accounted for approximately 7.4% of the total number of hired workers and 2.5% of the total number of paid hours worked. Skilled full-time positions were, however, generally satisfied through domestic supply, although Agricultural Employment Services (AES) personnel reported that some vacancies, especially in the dairy and nursery sectors, were difficult to fill. Federal agricultural programs (detailed in the Appendix) were reported to have contributed to an organized supply of agricultural workers.

British Columbia

Total agricultural employment in British Columbia in 1989 is estimated at 32 000, or 1 000 below last year's level. The number of paid workers increased by 1 000, but the number of operators fell by 2 000. The supply of agricultural workers declined as a result of the greater job opportunities in the nonfarm sectors arising from the generally improved provincial economy. Registered labor contractors, a system unique to British Columbia, continued to provide a larger share of the harvesting work force, particularly in the Fraser Valley.

The declining unemployment rate is reflected in decreased activities at the AES offices during the period from April 1 to August 31. Compared with the year-earlier period, employee registration fell by 14% to 12 655, vacanies notified fell by 17% to 16 935 and placements declined by 19% to 14 976. Overall, the supply of labor met the demand for seasonal workers but there were reported shortages of skilled livestock workers.

Alberta

The 1989 total farm employment in Alberta is estimated at 90 000, or 4% lower than last year's total. Although the number of paid workers increased by 2 000, this increase was offset by a decrease of 3 000 unpaid family workers and 2 000 operators. Total registration at the AES offices in fiscal 1988-89 was down by 24% to under 10 000, compared with fiscal 1987-88. Vacancies notified and placements, however, were up by 10% and 8%, respectively, indicating stronger demand for hired workers as the relatively strong nonfarm economy provided farmers with more nonfarm job opportunities. Data for AES activites for the April-August 1989 period are not available but it is reported that the situation has not changed from that a year ago. This year, 25 farmers participated in the Caribbean and Mexican Seasonal Workers Program and they employed 113 Mexican workers, compared with 18 employers and 77 employees last year. Apart from this small amount of supplementary harvest workers, there were also reports of shortages of skilled dairy workers.

The province's agricultural work experience training programs remained basically unchanged from year-earlier levels. The Summer Farm Employment Program, with a budget of $540 000, encouraged farmers to hire high school students during July and August by providing a wage subsidy of 50%, up to a maximum of $330 per month, per student. Another program, the Agricultural Work Experience Program, provided summer employment for 12 students to work along with Alberta Agriculture's district agriculturist.

The Green Certificate Program continued to encourage on-farm training for approximately 200 young adults annually. Employers were paid a daily fee--in effect a wage subsidy--of $25 for a first-year trainee and $30 for a second-year trainee for up to 21 days a month and a maximum of 24 months per trainee. The Farm Employment Program provided a wage subsidy of $2.50 per hour up to a maximum of $1 760 per farm. The budget of $4 million was fully subscribed on a first-come basis.

Saskatchewan

Saskatchewan's total farm employment declined again this year to reach 75 000, or 4% below last year's level. The number of paid workers, however, remained at last year's level of 18 000, but the number of unpaid family workers and operators fell by 1 000 and 3 000, respectively. Activities at the AES offices during the period from April 1 to August 31 increased relative to last year's figures. Employee registration increased by 7% to 3 969, vacancies notified were up by 11% to 2 294 and placements were up by 5% to 2 100. This increase in employee registration may be a reflection of the slow rate of growth in the provincial economy. Overall, the supply of farm labor matched the demand, although it was difficult to fill a few skilled dairy positions at the going wage rates.

Manitoba

Total farm employment in Manitoba increased this year following three consecutive years of decline. Total employment reached 40 000 or 8% more than last year. By classification of workers, the number of paid workers increased by 2 000 to 12 000, operators increased by 1 000 to 24 000 and unpaid family workers remained unchanged at 4 000. Activities at AES offices during the spring and early summer of 1989 were significantly reduced relative to the activities recorded during the corresponding period last year. Employee registrations were down by 25% to 4 624, vacancies notified were down by 44% to 2 747 and placements were down by 45% to 2 584. This year, five vegetable producers employed 67 Mexican workers through the Caribbean and Mexican Seasonal Workers Program, compared with four producers and 44 employees last year. Although AES reported difficulties in filling some skilled machinery operator and dairy positions, the demand for farm labor was generally met by local supply. In the continuing effort to improve the skills of farm operators and employees, Employment and Immigration Canada, under the Farm Management Initiative Program, has contracted Keystone Agricultural Producers as coordinator of agricultural training programs in Manitoba.

Ontario

This year, Ontario farmers were again unable to compete with the nonfarm sector for higher wages, resulting in a smaller domestic supply of seasonal agricultural workers. The booming Ontario economy, with an unemployment rate of about 5%, provided other job opportunities at much higher wages to many people who would have otherwise worked on farms during the harvest season. In addition, the number of seasonal workers from other provinces continued to decline. Consequently, over 11 000 seasonal offshore workers worked on Ontario's fruit and vegetable farms this year compared with a little more than 8 000 last year. The number of employers who employed offshore workers this year also increased and totaled 1 600 or 21% more than last year. The demand for skilled, full-time workers, especially in the dairy and nursery sectors, exceeded the supply of workers at various times during the year.

Total agricultural employment increased by 5 000 above last year's total of 112 000. The number of paid workers increased by 4 000 and the number of operators were up by 3 000, but the number of unpaid family workers declined by 2 000. The tight supply situation was also reflected in lower employee registrations at the AES offices, which were down by 13% during the period between April 1 and August 31 relative to the numbers registered during the same period last year. During the 1988-89 fiscal year, Ontario farmers received approximately $800 000 in grants through the Federal-Provincial Agricultural Employment Agreement for renovation and/or construction of seasonal housing accommodations. In addition, $350 000 was spent under the Day-Haul Program to provide free daily transportation for workers to and from the farm during the peak harvesting periods. The provincial Junior Agricultural Program continued again this year and enabled about 130 youths to gain on-farm experience for 50 days during the summer months.

Quebec

Quebec's total agricultural employment declined for the fourth successive year for an estimate of 12 000 workers below last year's total of 69 000. In terms of composition, the number of workers in each category decreased by 4 000 from 1988 levels. The Caribbean and Mexican Seasonal Workers Program supplied 736 offshore workers or nearly double last year's total of 372 workers. At the same time, the number of employers that participated in the program more than doubled, increasing from 28 to 65. AES activities during the period from April 1 to August 31 increased relative to those recorded during the corresponding period last year. Employee registrations were up by 32% to 19 150 and placements were up by 14% to 146 400 as more people, particularly new immigrants, reported for casual farm work to fill in between permanent nonfarm jobs. Federal and provincial expenditures under the Day-Haul program, which provides daily transportation of workers to and from farms, totaled $1.2 million. Overall, the demand for full-time workers was met by local supply, although AES personnel reported some shortages of skilled, dairy workers.

Atlantic provinces

Total agricultural employment in the Atlantic provinces this year is estimated at 18 000, or 5% lower than last year's level. Overall, the supply of seasonal labor, based on activities at the AES offices, was lower than that a year ago. However, this tight supply did not affect harvesting, as ideal weather conditions during the harvest season gave farmers extra time to harvest their crops. In addition, Nova Scotia's apple crop was light following last year's record yields. The Day-Haul program was used extensively during the peak harvesting time to transport workers to and from the farms. As expected, Nova Scotia's request to participate in the Caribbean and Mexican Seasonal Workers Program was granted by Employment and Immigration Canada. Twenty workers from the Caribbean worked on three vegetable farms this season. There were some reports of shortages of skilled workers, particularly in the dairy sector, but in general the demands were met.

OUTLOOK

The 1990 domestic supply of labor to the agricultural sector should remain around the same level as in 1989. Unemployment in the Canadian economy is forecast by the Conference Board of Canada (September 1989) to increase in 1990 by only 0.2 to 7.7%, although the growth rate of the national economy should decline from 2.8% this year to 1.8% next year. One factor that could affect the supply of agricultural labor is the proposed changes to the Unemployment Insurance system scheduled to be implemented on January 1, 1990. The effects of these changes are uncertain at this time; however, they could possibly enhance the supply of seasonal labor.

Farm wages are expected to keep pace with inflation and to increase by 5% on average. Although there is upward pressure for larger increases, low realized net farm income this year and limited expectation for improvement in 1990 would make it difficult for farmers to pay higher rates. Compensation to skilled, full-time employees is expected to increase above the average rate in an attempt by farmers to attract and retain better-trained workers, while the supply of foreign seasonal labor would dampen escalating wage rates paid to seasonal farm labor.

The downward trend in total agricultural employment is expected to continue in 1990. Greater demand for hired labor is expected to be offset by a decline in the number of unpaid family labor as more farmers pay wages to family members who work on the farm and as other family members obtain nonfarm jobs. The Caribbean and Mexican Seasonal Agricultural Workers Program is expected to play an even greater role in the supply of seasonal labor, particularly in Ontario and Quebec.

Appendix: Federal Agricultural Employment Programs

The federal programs in 1989 that directly contributed to agricultural labor market development were the same as those in 1988, namely the Agricultural Employment Services (AES), Federal-Provincial Agricultural Employment Agreements, Canadian Jobs Strategy, and the Caribbean and Mexican Seasonal Agricultural Workers Program. Direct federal expenditures under these programs in the 1988-89 fiscal year totaled $40.8 million, which was 13% higher than the value in fiscal 1987-88 (Table 3). All of these programs operated under the auspices of Employment and Immigration Canada (EIC).

The AES system operates in all provinces except Newfoundland through a network of 66 main offices, eight branch offices and 35 seasonal suboffices. The system is managed by private contractors working under contract with EIC, and its main function is to act as a clearinghouse for farm labor by providing sevices to both farmers and farm workers. AES offices play a vital role in the agricultural labor market, particularly in the fruit and vegetable sector. In fiscal 1988-89, farmers listed approximately 325 000 vacancies through the system, and about 88% or 286 000 of these vacancies were filled. About 2% of those positions filled were permanent-type jobs, 20% were seasonal/temporary and 78% were casual positions (one to five days). During the months of peak activity from April through August, about 200 000 vacancies were filled. EIC spent $7.2 million in fiscal 1988-89 to provide this service to farmers and farm workers. The level of provincial activity during the peak period of April through August is shown in Table 4.

Federal-Provincial Agricultural Employment Agreements exist in all provinces except Alberta and Newfoundland. These agreements make provision for cost-sharing funds for such services as seasonal housing construction and/or improvements, labor market research and daily farm worker transportation services. In fiscal 1988-89, the federal government contributed $2.1 million under the agreements, 90% of which was used for the provision of seasonal housing and daily transportation of farm workers by Ontario and Quebec. These agreements expired on March 31, 1989, but will be continuing under a new Memorandum of Understanding (MOU) mechanism. To date, only Ontario has signed a formal MOU and the other provinces, except Alberta and Newfoundland, are expected to sign in early 1990.

The Canadian Jobs Strategy (CJS) is EIC's umbrella for all of its various training programs. The agricultural sector expenditures under CJS in fiscal 1988-89 totaled $31.5 million, or 14% higher than expenditures in fiscal 1987-88 (Table 3). Greater emphasis was placed on providing training for more on-farm related work. Compared with values in fiscal 1987-88, expenditures under the Skill Investment, Skill Shortages and Direct Purchase Training programs increased by 144% from $6.5 million to $15.9 million in fiscal 1988-89. These programs are expected to continue to expand and undoubtedly to provide greater opportunities to improve agricultural labor skills through training that would enhance the supply of skilled workers available to fill permanent positions.

The Caribbean and Mexican Agricultural Worker Program was used extensively in Ontario and to a lesser extent in Quebec in an attempt to fill the shortfall in the supply of domestic seasonal agricultural labor. This year, the number of foreign workers and farmers who participated in the program reached record levels of 12 224 and 1 708, respectively (Table 5). Approximately 92% of the foreign workers worked in Ontario, 6% in Quebec and the remainder in Manitoba, Alberta and Nova Scotia. The participation rate of Mexican workers in the program continued to expand and reached 36% this year, compared with 30% last year. Of the total increase in the number of foreign workers this year, Mexicans accounted for 50% or 1 840. Based on the prospects of the seasonal farm labor market, it is expected that this program will be expanded again next year.

TABLE I AVERAGE ANNUAL EMPLOYMENT IN CANADIAN AGRICULTURE, BY REGION, 1975-89

	Canada[a]	British Columbia	Prairie provinces	Ontario	Quebec	Atlantic provinces
			(thousands of persons)			
1975	483	16	258	117	70	21
1976	472	18	247	112	74	20
1977	464	21	227	127	71	18
1978	474	25	230	131	72	16
1979	484	23	229	146	68	19
1980	479	22	216	143	78	19
1981[r]	488	26	219	143	79	19
1982[r]	465	30	208	130	77	19
1983[r]	480	33	214	134	80	18
1984[r]	480	33	224	126	76	20
1985[r]	475	36	214	121	83	22
1986[r]	467	31	216	121	79	20
1987[r]	461	31	218	117	74	21
1988	444	33	209	112	69	19
1989[b]	429	32	205	117	57	18

a Total may not equal sum of regions because of rounding error
b Agriculture Canada estimates
r Revised based on 1986 Census of Canada

Source: Statistics Canada, The Labour Force, cat. no. 71-001, monthly.

TABLE 2 AVERAGE ANNUAL EMPLOYMENT IN AGRICULTURE, BY CLASS OF WORKER, CANADA, AND REGIONS, 1980-89

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989[a]
	(thousands of persons)									
Canada										
Paid	156	151	148	156	156	163	166	174	161	165
Unpaid	79	89	80	79	76	68	67	58	49	40
Self-employed	243	248	237	245	248	244	234	230	234	224
Total[b]	479	488	465	480	480	475	467	461	444	429
British Columbia										
Paid	12	14	15	18	18	19	16	17	18	19
Unpaid	n.a.	1	2	2	2	2	2	2	1	1
Self-employed	n.a.	11	13	13	13	15	13	12	14	12
Total	22	26	30	33	33	36	31	31	33	32
Prairie provinces										
Paid	49	48	50	51	55	52	56	63	54	58
Unpaid	36	39	36	34	35	33	34	28	25	21
Self-employed	131	131	122	128	135	128	126	126	130	126
Total	216	219	208	214	224	214	216	218	209	205
Ontario										
Paid	58	56	51	57	48	52	54	52	49	53
Unpaid	22	22	18	18	18	14	13	12	10	8
Self-employed	63	64	61	60	60	55	55	53	53	56
Total	143	143	130	134	126	121	121	117	112	117
Quebec										
Paid	27	23	22	24	24	28	29	29	29	25
Unpaid	18	24	23	23	20	19	17	15	11	7
Self-employed	33	33	33	33	33	36	33	29	29	25
Total	78	79	77	80	76	83	79	74	69	57
Atlantic provinces										
Paid	4	4	8	4	4	9	5	5	5	5
Unpaid	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Self-employed	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total	19	19	19	18	20	22	20	21	19	18

a Agriculture Canada estimates
b Total may not equal sum of classes because of rounding error

Source: Statistics Canada, The Labour Force, cat. no. 71-001, monthly.

TABLE 3 DIRECT FEDERAL EXPENDITURES IN AGRICULTURAL LABOR PROGRAMS, BY PROGRAM, 1984-85 TO 1988-89

	1984-85	1985-86	1986-87	1987-88	1988-89
	(thousands of dollars)				
Agricultural Employment Services	5 896	5 716	5 880	6 707	7 231
Federal-Provincial Agricultural Employment Agreements	615	893	353	1 567[r]	2 081[c]
Canadian Jobs Strategy (CJS)[a]	-	-	-	-	-
Direct Purchase Training	-	4 208	6 117	4 803	7 906
Job Development	-	7 021	20 220	9 081	6 143
Job Entry	-	5 073	5 544	9 371	6 703
Skill Investment	-	138	34	-	1 918
Skill Shortages	-	40	32	1 698	6 028
Section 25[b]	-	1 453	2 229	1 868	2 485
Innovations	-	-	167	785	257
Community Futures	-	3 207	501	124	50
Total, CJS	-	21 140	34 845	27 730	31 490
Total, all programs	6 511	27 749	41 078	36 004	40 802

a Amounts shown are the value of contracts and may not necessarily equal expenditures

b The purpose of Section 25 (previously Section 38) is to create incremental productive term (6 to 52 weeks) employment for persons collecting Unemployment Insurance benefits or persons eligible for Unemployment Insurance benefits

c Includes expenditures under the Day-Haul Program

r Revised

Source: Employment and Immigration Canada, Labour Market Services Branch, Agricultural Employment Development Programs and Services (Ottawa: EIC, 1989).

TABLE 4 ACTIVITY OF AGRICULTURAL EMPLOYMENT SERVICES BY PROVINCE, FOR THE PERIOD FROM APRIL 1 TO AUGUST 31, 1988 AND 1989

	Employee registrations		Vacancies notified		Employment placements	
	1988	1989	1988	1989	1988	1989
	(number of persons)					
British Columbia	14 687	12 655	20 340	16 935	18 547	14 976
Alberta	5 342	n.a.	5 150	n.a.	4 858	n.a.
Saskatchewan	3 724	3 969	2 068	2 294	1 999	2,108
Manitoba	6 133	4 624	4 863	2 747	4 727	2 584
Ontario	22 679	19 639	35 265	28 742	31 065	25 403
Quebec	14 487	19 149	151 371[a]	155 004	128 863[a]	146 405
New Brunswick	546	673	813	1 110	570	951
Prince Edward Island	1 177	1 403	1 095	1 136	1 063	1 109
Nova Scotia	6 156	4 859	6 374	5 245	6 339	5 247

[a] The number of vacancies notified and employment placements is accounted for differently in Quebec and as such is not comparable with levels in other provinces. For example, 10 daily workers working for 5 days on the same farm would be counted as 50 placements in Quebec but normally as only 10 placements in other provinces.

Source: Employment and Immigration Canada, Labour Market Planning and Adjustment, Regional Monthly Report on Agricultural Employment Services (Ottawa: EIC, 1989).

ABLE 5 CARIBBEAN AND MEXICAN SEASONAL AGRICULTURAL WORKERS PROGRAM, WORKER AND EMPLOYER PARTICIPATION, BY PROVINCE, 1980-89

	Total		Quebec		Ontario		Manitoba		Alberta		Nova Scotia	
	Workers	Employers	Workers	Employers	Workers	Employers	Workers	Employers	Workers	Employers	Workers	Employers
980	6 001	1 048	32	2	5 864	1 012	35	5	70	29	n.a.	n.a.
981	5 798	1 050	24	2	5 647	1 014	44	5	83	29	n.a.	n.a.
982	5 510	976	30	2	5 356	942	35	4	89	29	n.a.	n.a.
983	4 564	896	30	2	4 428	864	31	4	75	26	n.a.	n.a.
984	4 502	854	30	2	4 368	821	29	4	75	27	n.a.	n.a.
985	5 005	849	30	2	4 872	823	32	3	71	21	n.a.	n.a.
986	5 166	843	55	2	5 007	816	32	3	72	22	n.a.	n.a.
987	6 337	987	112	6	6 124	959	32	3	69	19	n.a.	n.a.
988	8 537	1 378	372	28	8 044	1 328	44	4	77	18	n.a.	n.a.
989	12 224	1 708	736	65	11 288	1 610	67	5	113	25	20	3

urce: Employment and Immigration Canada, Labour Market Services Branch, Agricultural Employment Programs and Services (Ottawa: EIC 1989).

AGRICULTURAL LAND

S. Henderson

HIGHLIGHTS

An improved balance sheet, three years of respectable income performance, urban development pressures, and speculative buying at the perceived bottom of the market could fuel a strong but probably short-lived resurgence of land prices in 1990, following positive gains in every province during 1989.

SITUATION

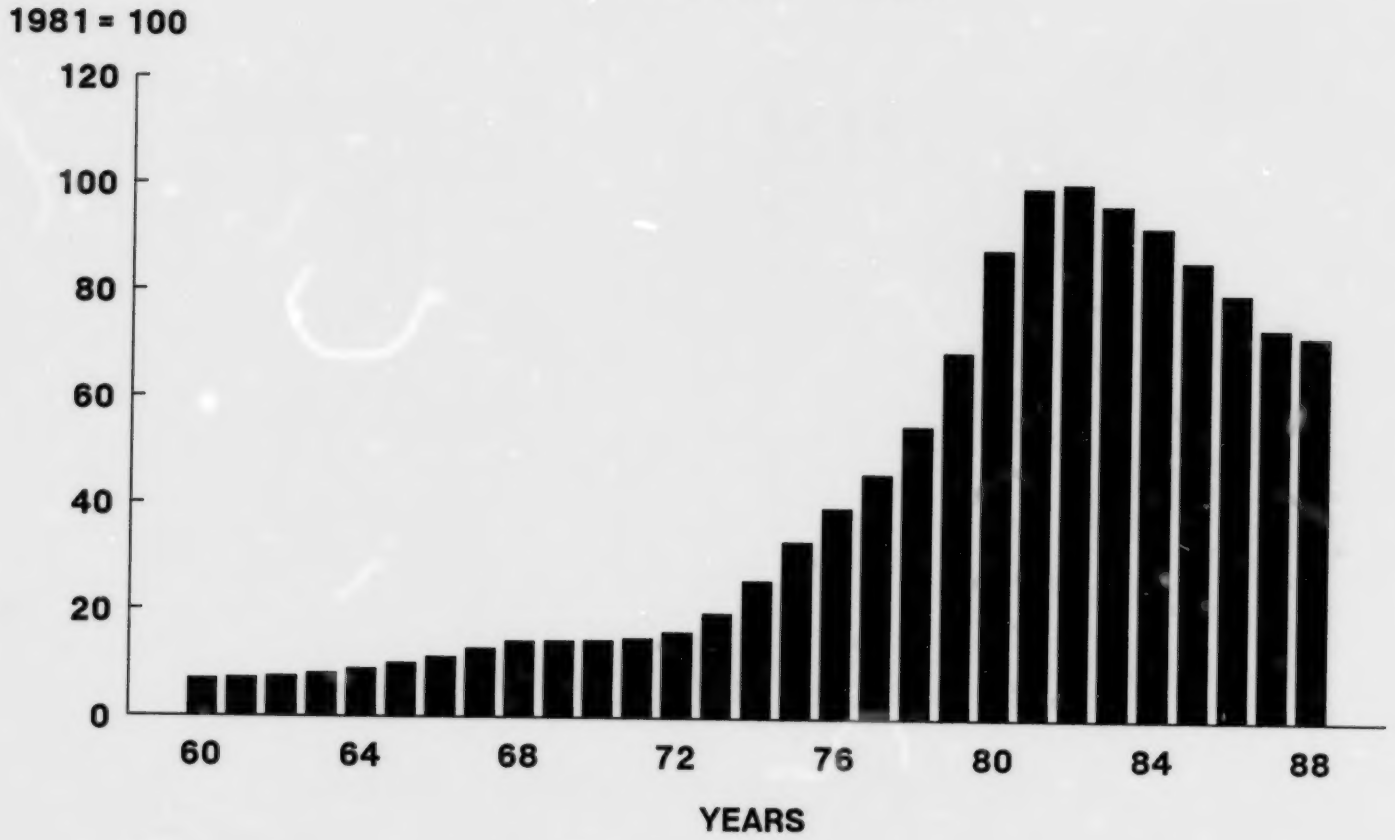
The protracted fall in agricultural land markets, which began in 1981-82 and which appeared to be leveling off in some regions in 1987-88, has now fully reversed itself in every province. Even in Saskatchewan, where the hard-pressed grains sector dragged down real land prices by 1988 to half the levels of 1980 (Table 1), there is new evidence of a return to modest growth in nominal farmland values (Table 3). For Canada as a whole, the combined real value of farmland and buildings at $73 billion in 1988 was still lower than their value in 1979. In terms of real value per hectare for land only, one would have to go back to 1974 to find lower levels than those prevailing today. Summary statistics on the nominal and real values of farmland appear in Tables 1 and 4, and are charted in Figures 1, 2 and 3. Additional information on the aggregate values of farmland and buildings appears in Tables 2 and 5. Table 3 contains data derived from the results of the annual Farm Credit Corporation survey of cultivated bare land values.

Farmland values are a function of many factors, including productive capacity, location, price and income expectations, development potential, and discount rates. The generally poor performance of the grains sector during much of this decade, combined with high real interest rates and high debt levels (following rapid expansion during the 1970s), put considerable downward pressure on land values, which exhibited a compound annual growth rate of -8.1% in real terms over the 1980-88 period. In turn, collapsing land markets, particularly in the West, led to cascading financial pressures on those with large debts as debt/asset ratios increased, loan security and wealth evaporated, and operating credit became harder to find for these farmers. The resulting sectoral shake-out had generated major balance sheet adjustments by 1988, in effect setting the stage for renewed interest in investment in farmland.

British Columbia

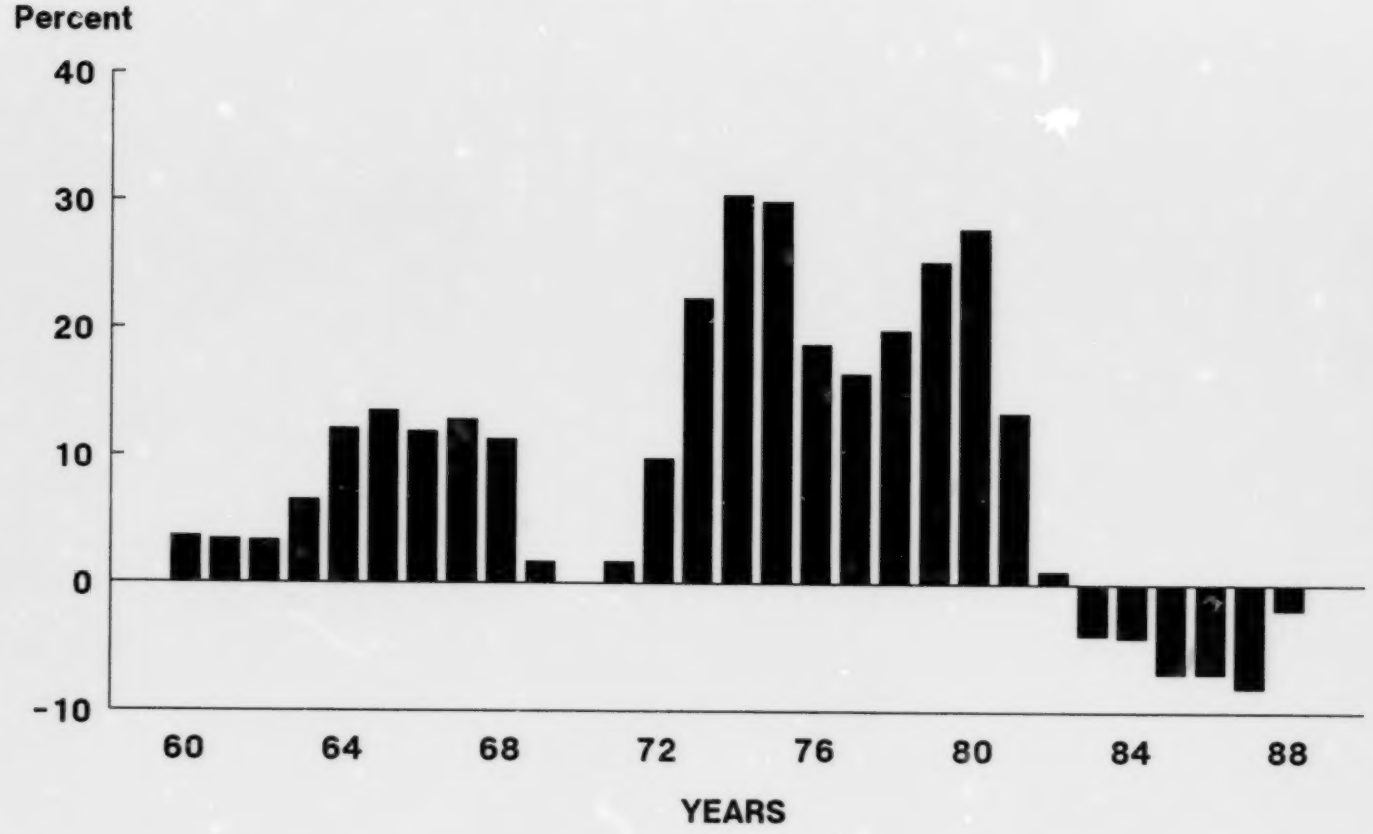
Among the provinces, only Alberta experienced a greater rate of decline in farmland values between 1980 and 1988; the compound annual growth rate for British Columbia was -9.4% (versus -9.8% for Alberta), which exceeded the national average of -8.1% (Table 1). The aggregate value of land and buildings has shown no real annual increase since 1981, but there was a noticeable slowing in the rate of decline in 1988 (Table 2).

FIGURE 1: INDEX OF VALUE PER HECTARE FARMLAND, CANADA 1960 - 1988



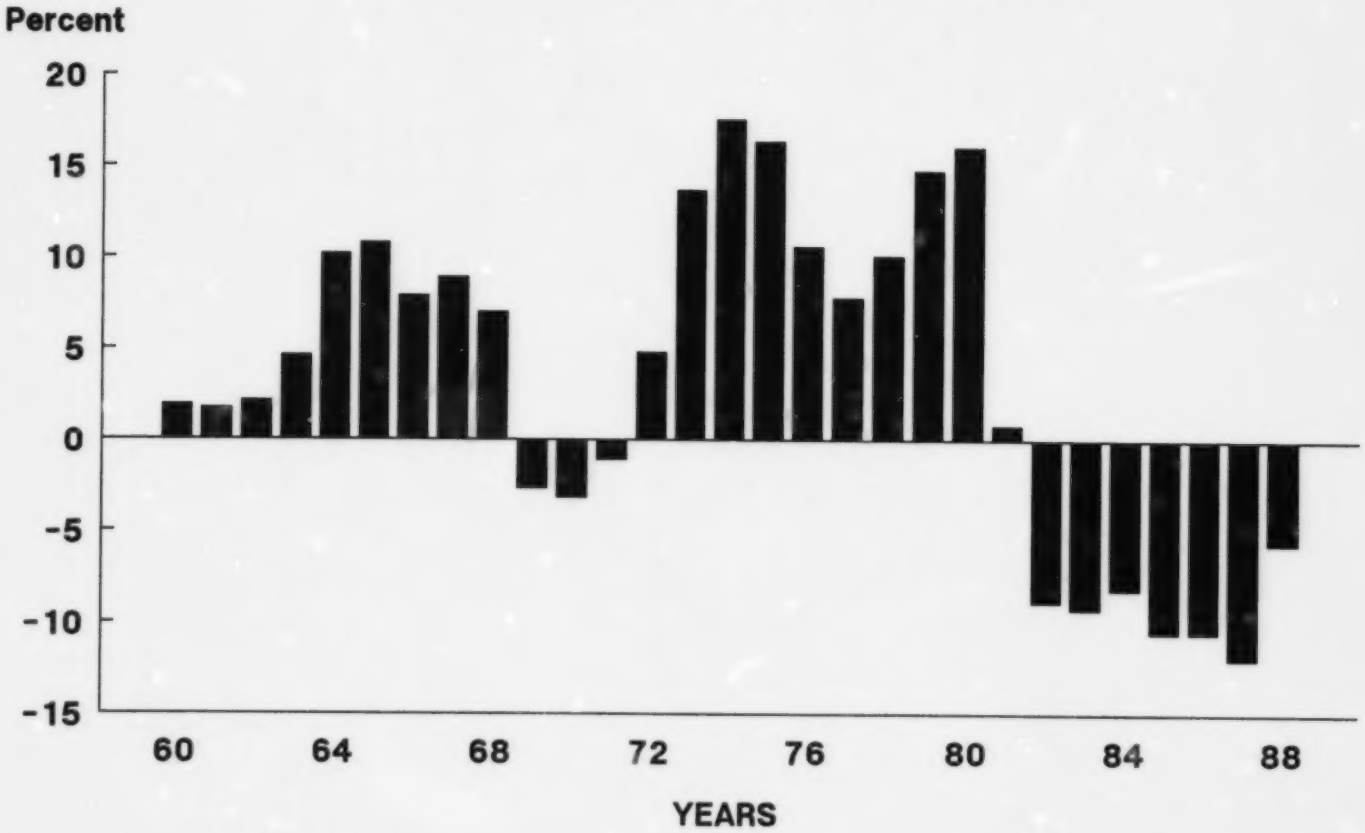
Source: Statistics Canada

FIGURE 2: ANNUAL CHANGE IN NOMINAL VALUE PER HECTARE, FARMLAND, CANADA 1960 - 1988



Source: Statistics Canada

FIGURE 3
ANNUAL CHANGE IN REAL VALUE PER HECTARE
FARMLAND, CANADA, 1960 - 1988



Source: Statistics Canada

Currently, British Columbia is experiencing positive growth in the nominal value of cultivated bare land, as evidenced by the Farm Credit Corporation's annual survey (Table 3). This return to increases in the nominal value of land is a Canada-wide phenomenon for 1988-89. In the case of British Columbia, it complements renewed economic growth in other sectors, which is being supported in part by a significant inflow of investment capital from offshore, much of which is directly affecting real estate markets, including farmland, in the lower coastal region.

Prairie provinces

In Alberta, where actual farm real estate transactions data are compiled by Alberta Agriculture, farmland values declined again in 1988, despite a 10.4% increase in the number of acres transferred (Egglestone 1989). However, strong increases are being recorded in 1989, with acres transferred up 14.2% and value rising 11.3% to a level of $949 per hectare (Alberta Agriculture 1989). The FCC annual survey shows a 5.7% increase in nominal bare land values in Alberta. The difference between FCC's 5.7% figure and Alberta Agriculture's 11.3% figure is explained by FCC's survey methodology, which employs a benchmarking approach in order to standardize for the quality of land being transferred. Data from Statistics Canada show the total real value of farmland and buildings in Alberta was $13.4 billion in 1988 (1981 dollars), compared with $30.0 billion in 1981.

The recovery in agricultural land markets is taking longer to materialize in Saskatchewan than elsewhere because of the predominance of grains and oilseeds. The 1988 drought left grain inventories in Saskatchewan at very low levels and the rebuilding of stocks will involve some income deferral. Financial stresses have been especially difficult in Saskatchewan. The province leads in the percentage of farm borrowers in arrears (16.5%), and FCC is currently holding about 134 000 hectares of farmland. Nevertheless, there are encouraging signs of recovery in Saskatchewan land markets; the FCC survey indicates nominal increases of 1.7% in 1989 (Table 3), but there is considerable variation within the province.

The annual rates of decline in nominal and real values per hectare in Manitoba since 1980 have been the lowest of the western provinces (Table 1). From 1987 to 1988 the aggregate value of lands and buildings declined by 8.0% (11.5% real). There has been some debate over the future direction in land prices, with Royal Bank and FCC officials pointing to increases, while Manitoba Agriculture's chief statistician has argued that the financial conditions do not yet exist to support increasing land values (Manitoba Co-operator, July 27, 1989). The FCC annual survey is showing gains of 6.1% in nominal terms for the 12 months ending July 1989.

Ontario

More than half of Canada's best agricultural land (Class 1) is found in Ontario. The rapid pace of urban real estate inflation in south central and southwestern Ontario is beginning to have dramatic spillover effects on the value of agricultural land. Nominal increases of 11.4% and 23.8% are reported by FCC for 1987-88 and 1988-89, respectively (Farm Credit Corporation 1989). However, the real value of lands and buildings in Ontario in 1988 were still 50% below the level of 1980. In assessing the implications for agriculture

of rapid urbanization, it is noteworthy that in southwestern Ontario 94% of rural lands converted to urban uses between 1981 and 1986 were prime agricultural lands (Classes 1 to 3) while 65% were Class 1. However, for the province as a whole, the absolute amount of prime agricultural land urbanized between 1981 and 1986 was only 17 081 hectares, (Environment Canada 1989). Changes announced in June 1989 to Ontario's Farm Tax Rebate Program will eliminate rebates on land rented out. This could dampen demand for agricultural land in urban fringe areas slightly but is not expected to have a major impact on prices (OMAF 1989).

Quebec

For the fourth consecutive year, nominal farmland values have increased in Quebec. In addition, for the first time since 1981, there is reason to believe that the 1989 data will show a return to real growth (see Table 3). The financial health of Quebec's farm sector is the best in Canada. Strong income performance in 1989 should support continued strong demand and rising prices for agricultural land. Urban pressures continue to exert upward pressure on Quebec land prices.

Atlantic provinces

Compound annual growth rates in the real value of farmland during 1980-89 ranged from -5.3% in Newfoundland to -0.2% in New Brunswick. FCC reports increases in cultivated bare land values for 1988-89, with Nova Scotia leading the way at 13.1%. Strong potato prices are expected to support cash income gains in 1989 ranging as high as 52% (in Prince Edward Island), which is providing support to 1989 land prices, despite a relatively low number of transactions.

United States

The recovery in U.S. farmland values began in 1987 and was followed by a nominal gain of 6% in 1988. A similar increase is occurring in 1989 and is expected to continue into 1990. Factors governing this recovery include higher net farm income, lower real interest rates, a reduced debt burden, and moderate levels of general inflation. Increases were reported in 9 of 10 regions; only the southern plains region showed declines in 1988. The northern plains are experiencing nominal increases averaging 9% (USDA 1989).

OUTLOOK

The buoyant performance of land markets in 1989 appears to be a lagged response to record-high farm income levels in 1987 and 1988 together with relatively favorable crop and livestock receipts anticipated for 1989. Further increases in land values are expected in 1990, and those increases will equal or exceed the general level of inflation.

A close look at Agriculture Canada's September farm income forecast reveals that the principal reason for the 10% drop in net cash income in 1989 lies with the $1.2 billion increase in operating expenditures (Agriculture Canada 1989a). The main components of the expenses increase are interest payment increases due to higher interest rates,

drought-induced increases in feed costs, and an increase in planted area. However, the indications are that land purchases are being financed out of equity rather than debt. From this, one may infer that purchasers on average are not heavily burdened with debt and interest payments and consequently are enjoying relatively high net incomes.

Despite the financial hardships experienced by a minority of farmers during much of this decade, there have always been significant numbers of very successful and profitable farms, which are generally those operated by good managers whose debt levels did not get out of hand during the late 1970s. These individuals have been watching land prices drop each year since 1981-82. Some of them began to expand in 1987 and 1988, causing land markets to bottom out and to show signs of possible increases. This perception appears to have triggered a surge of speculative and strategic buying in 1989 but, until a clear upward trend is established, investors are exercising caution by financing out of equity.

Caution is warranted, because the conditions do not yet exist for a return to sustained increases in the real value of agricultural land, except perhaps in areas strongly affected by urban development pressures. Current prospects are for a moderate decline in total farm cash receipts in 1990, primarily reflecting a forecast drop in government payments. A general economic slowdown in 1990 should bring interest rates down as inflation moderates (CBOC 1989), but real interest rates remain relatively high and should act to restrain expansion through land ownership. Medium-term farm income forecasts provide no basis for expecting land prices to move upward beyond 1991.

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TABLE 1 NOMINAL AND REAL[a] FARMLAND VALUES AND COMPOUND GROWTH RATES, SELECTED YEARS

	Values of Farmland Alone						Compound Annual Growth Rate			
	1970		1980		1988		1970-80		1980-88	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
	($/ha)						(%)			
British Columbia	309	753	1 475	1 659	1 085	755	16.9	8.2	-3.8	-9.4
Alberta	124	302	966	1 086	682	474	22.8	13.7	-4.3	-9.8
Saskatchewan	114	278	655	737	519	361	19.1	10.2	-2.9	-8.5
Manitoba	126	307	655	737	563	392	17.9	9.2	-1.9	-7.6
Ontario	368	897	2 058	2 315	1 989	1 383	18.8	9.9	-0.4	-6.2
Quebec	124	302	766	862	951	661	20.0	11.1	2.7	-3.3
New Brunswick	82	200	469	527	744	517	19.1	10.2	5.9	-0.2
Nova Scotia	74	180	524	589	778	541	21.6	12.6	5.1	-1.1
Prince Edward Island	121	295	827	930	1 176	818	21.2	12.2	4.5	-1.6
Newfoundland	n.a.	n.a.	1 455	1 636	1 527	1 062	-	-	0.6	-5.3
Canada	148	361	906	1 019	744	517	19.9	10.9	-2.4	-8.1

[a] 1981 dollars

Source: Raw data from Statistics Canada.

TABLE 2 ANNUAL CHANGE IN NOMINAL AND REAL[a] VALUES OF FARMLAND AND BUILDINGS, SELECTED YEARS

	1981	1982	1983	1984	1985	1986	1987	1988
				(%)				
British Columbia	15.2 (2.4)	-9.5 (-18.3)	0.3 (-5.3)	-5.6 (-9.5)	-7.5 (-11.0)	-8.5 (-12.1)	-11.4 (-15.2)	-1.5 (-5.3)
Alberta	10.4 (-1.8)	-.9 (-10.6)	-7.8 (-12.9)	-8.8 (-12.6)	-7.8 (-11.3)	-9.8 (-13.3)	-4.6 (-8.7)	-2.6 (-6.3)
Saskatchewan	15.0 (2.2)	8.3 (-2.3)	-1.9 (-7.3)	-3.0 (-7.0)	-9.0 (-12.5)	-7.0 (-10.7)	-14.9 (-18.5)	-7.9 (-11.4)
Manitoba	16.0 (3.1)	-7.3 (-16.3)	-.1 (-5.6)	-3.3 (-7.3)	-2.1 (-5.9)	-4.2 (-8.0)	-7.0 (-10.9)	-8.0 (-11.5)
Ontario	10.1 (-2.1)	-3.4 (-12.8)	-8.3 (-13.4)	-3.4 (-7.4)	-8.3 (-11.8)	-9.3 (-12.9)	-5.3 (-9.3)	9.5 (5.3)
Quebec	11.0 (-1.3)	2.8 (-7.2)	1.7 (-3.9)	-3.2 (-7.2)	-5.3 (-8.9)	0.0 (-4.2)	1.2 (-3.1)	0.2 (-3.7)
New Brunswick	18.5 (5.4)	-.6 (-10.3)	4.7 (-1.0)	3.6 (-.7)	4.7 (.7)	-1.6 (-5.5)	-1.4 (-5.6)	-1.4 (-5.2)
Nova Scotia	7.9 (-4.1)	-1.8 (-11.4)	3.4 (-2.3)	-.8 (-4.9)	1.4 (-2.5)	1.4 (-2.7)	-0.3 (-4.5)	-0.3 (-4.1)
Prince Edward Island	16.3 (3.4)	-5.0 (-14.3)	5.3 (-.5)	0.2 (-3.9)	5.3 (1.3)	-3.1 (-7.0)	-0.8 (-5.0)	-0.8 (-4.6)
Newfoundland	10.1 (-2.1)	-7.7 (-16.7)	-1.1 (-6.5)	-4.4 (-8.3)	-1.1 (-4.8)	-3.1 (-6.9)	1.8 (-2.5)	1.8 (-2.1)
Canada	12.2 (-.2)	-0.2 (-9.9)	-4.6 (-9.8)	-4.8 (-8.8)	-7.5 (-11.0)	-7.6 (-11.2)	-7.7 (-11.6)	-1.3 (-5.0)

[a] Real percentage change in parentheses

Source: Raw data from Statistics Canada.

TABLE 3 CHANGE IN VALUE OF CULTIVATED BARE LAND, 1984 TO 1989

	Change in Nominal Bare Land Values				
	1984-85	1985-86	1986-87	1987-88	1988-89
			(%)		
British Columbia	-13.7	-6.6	-11.3	-1.3	3.8
Alberta	-8.3	-8.2	-8.3	-8.2	5.7
Saskatchewan	-10.3	-8.3	-15.3	-11.7	1.7
Manitoba	-7.3	-4.9	-6.7	-11.3	6.1
Ontario	-9.4	-4.8	-3.9	11.4	23.8
Quebec	-1.0	1.4	2.3	1.0	4.3
New Brunswick	1.0	-2.1	0.6	-0.1	1.8
Nova Scotia	-4.3	1.7	2.1	2.6	13.1
Prince Edward Island	-11.4	-7.9	-7.5	0	6.4
Canada	-8.8	-6.9	-10.1	-7.7	5.4

Source: Farm Credit Corporation, Trends in Farmland Values. No. 23, December 1989.

TABLE 4 INDEX OF VALUES PER HECTARE OF FARMLAND[a]

	1976	1982	1983	1984	1985	1986	1987	1988	Compound Annual Growth Rate 1976-81	1981-88	1976-88
	(1981 = 100)								(%)		
British Columbia	43.2	90.6	90.8	85.8	79.3	72.7	64.7	64.1	18.3	-6.2	3.3
Alberta	34.8	99.1	91.3	83.2	76.8	69.2	65.8	63.7	23.5	-6.2	5.2
Saskatchewan	36.7	108.4	106.6	103.8	94.5	88.1	74.8	68.6	22.2	-5.2	5.4
Manitoba	40.0	93.2	93.8	91.1	89.7	86.4	80.3	73.8	20.1	-4.2	5.2
Ontario	49.3	99.1	93.3	92.4	86.9	80.8	77.6	86.0	15.2	-2.1	4.7
Quebec	38.5	105.0	109.0	107.5	104.0	105.8	107.9	109.1	21.0	1.3	9.1
New Brunswick	45.1	102.5	110.8	118.4	128.0	129.7	129.7	129.7	17.3	3.8	9.2
Nova Scotia	42.9	102.5	110.6	114.1	120.7	127.8	130.4	132.9	18.4	4.1	9.9
Prince Edward Island	38.5	97.9	106.1	109.6	118.8	118.4	118.4	118.4	21.0	2.4	9.8
Newfoundland	51.9	94.3	95.2	92.7	93.3	92.0	92.0	92.0	14.1	-1.2	4.9
Canada	39.5	100.9	96.9	92.8	86.4	80.3	73.8	72.4	20.4	-4.5	5.2

[a] The index of values per hectare of farmland measures the percentage change through time in the value of land.

Source: Statistics Canada.

TABLE 5 INDEX OF VALUES PER HECTARE OF FARMLAND AND BUILDINGS[a]

	1976	1982	1983	1984	1985	1986	1987	1988	Compound Annual Growth Rate 1976-81	1981-88	1976-88
				(1981 = 100)						(%)	
British Columbia	42.3	90.9	91.6	86.9	80.7	74.2	66.1	65.4	18.8	-5.9	3.7
Alberta	35.5	98.7	90.5	82.2	75.5	67.8	64.5	62.5	23.0	-6.5	4.8
Saskatchewan	37.2	108.1	106.0	102.9	93.5	86.9	73.8	67.8	21.9	-5.4	5.1
Manitoba	41.2	92.7	92.7	89.5	87.6	83.9	78.0	71.7	19.4	-4.6	4.7
Ontario	52.7	97.9	91.0	89.0	82.7	76.0	72.9	80.9	13.7	-3.0	3.6
Quebec	41.1	103.6	106.2	103.6	98.2	99.4	101.4	102.4	19.5	0.3	7.9
New Brunswick	49.6	100.7	106.9	112.3	119.2	118.9	118.9	118.9	15.1	2.5	7.6
Nova Scotia	47.8	100.4	106.9	107.6	111.6	115.8	118.2	120.5	15.9	2.7	8.0
Prince Edward Island	43.5	95.6	101.5	102.5	108.8	106.1	106.1	106.1	18.1	0.8	7.7
Newfoundland	64.9	90.6	88.1	82.8	80.4	76.6	76.6	76.6	9.0	-3.7	1.4
Canada	41.8	99.8	95.3	90.7	84.1	77.7	71.7	70.9	19.1	-4.8	4.5

[a] The index of values per hectare of farmland and buildings measures the percentage change through time in the value of land and buildings.

Source: Statistics Canada.

FARM MACHINERY AND STRUCTURES

A. Asselstine

HIGHLIGHTS

Investment in current dollars in 1990 is expected to decrease slightly by 1 to 2% because of a decrease of up to 2% in machinery purchases and an increase of 2 to 4% in construction expenditures. In real terms, this means a 2 to 4% decrease in machinery purchases and no change in construction expenditures. Machinery sales in Canada have steadied at a low level and will not show large increases until there is a substantial improvement in farm income prospects. New machinery prices are likely to rise by 1 to 3%. Construction costs are likely to rise by 3%.

SITUATION

WORLD

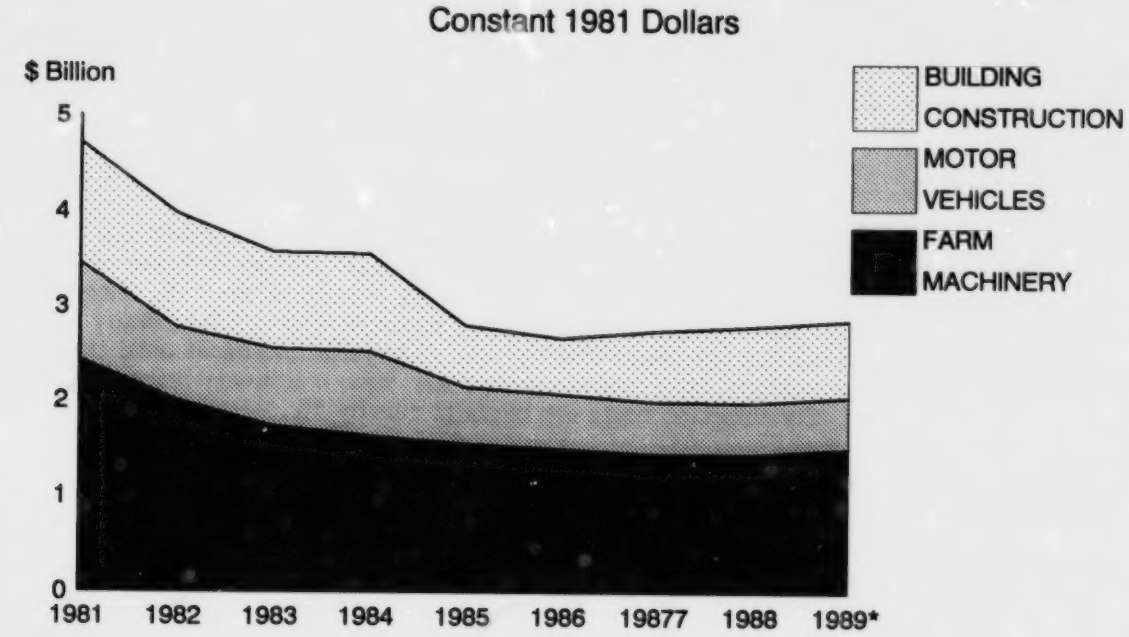
Farm machinery sales in 1988 among member countries of the Organization for Economic Cooperation and Development (OECD) improved for the first time since the first part of the 1980s. Sales in 1989 are expected to stay level. There were mixed changes in sales directions in the large European market in 1988 and 1989. Italy, France, United Kingdom, Finland and Sweden had increased sales in 1988. Tractor registrations in 1988 increased by 14.4% in the United Kingdom and 7.1% in France over 1987 levels.

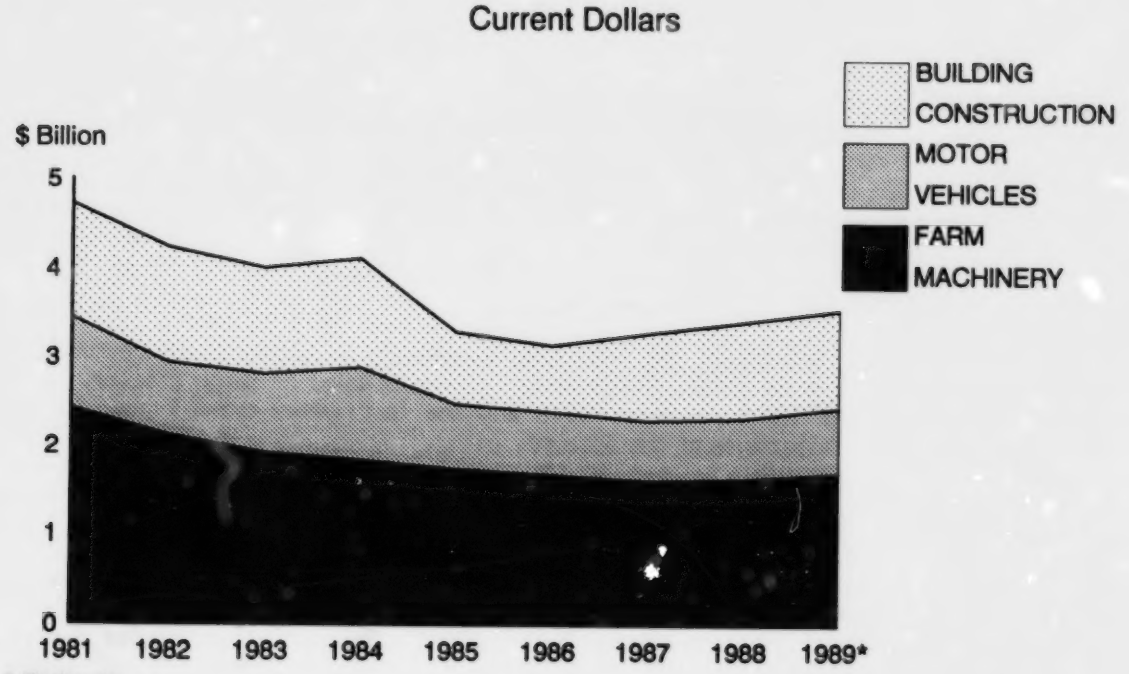
West Germany, Denmark and Norway had decreased sales. The West German registrations were 8% lower in 1988 than in 1987. In Europe both overall registrations during the first nine months of 1989 and overall expected annual sales for 1989 are level, but levels in some countries are up and those in others are down. France and the United Kingdom, which had stronger markets in 1988, are both expected to have weaker markets in 1989. A 10% decrease in registrations is expected for the United Kingdom, with sales down in both dairy and crop areas. In Denmark sales are expected to increase by 8% in 1989 after a large decrease in 1988.

In the United States, the Farm and Industrial Equipment Institute (FIEI) reported unit tractor sales down 1.3% in 1988. There were increased sales of large tractors of over 100 horsepower of both the two-wheel-drive and the four-wheel-drive types. Combine sales were down by 16% because of the drought.

During the period from January to September 1989, unit sales of all tractors were down by 0.3%. Sales of two-wheel-drive tractors under 40 horsepower were down by 13.5%, while sales of all other sizes of tractors were up. The largest increase in sales was of four-wheel-drive tractors of over 200 horsepower, which increased by 75%. For the same January to September 1989 period, combine and baler sales were up by 40% and 27%, respectively. Unit sales of mower conditioners, forage harvesters and windrowers were up by 24%, 12% and 34%, respectively. Sales of combination grinder mixers were down by 9%.

Figure 1: CAPITAL EXPENDITURES IN CANADIAN AGRICULTURE





* Estimate.

Source: STATISTICS CANADA, Catalogue No. 13-211.

In 1989, total sales of machinery in the United States are expected to improve over 1988 levels. The United States Department of Agriculture (USDA) estimates that 1988 expenditures for new and used farm machinery were 4.3% above 1987 levels, and forecasts a similar increase in 1989. Low real interest rates, higher net cash income, reduced outstanding debt and increased acreage have substained machinery demand over the past two years. Demand for farm machinery is being enhanced by an older-than-average stock as a result of the decreased purchases in the 1980s.

The United States farm machinery market started its relatively slow rate of improvement in the fall of 1987. This improving market extended into the 1988 spring planting season and into the hay and forage equipment sales period of early summer. In the second half of 1988, the demand for machinery weakened as a result of the 1988 drought in the midwestern states. Of particular note is the drop in sales of combines to 16% below year-earlier levels. In 1989 the United States tractor market sales varied with the size of the tractor. Sales of tractors under 40 horsepower continued to decline because of reduced demand. The market for tractors between 40 and 100 horsepower has stayed stable at close to 1986 levels, as these tractors are used mainly on livestock farms, which had relatively level incomes. The markets for both two-wheel-drive tractors over 100 horsepower and four-wheel-drive tractors were well above year-earlier sales levels. These large tractors are purchased by the larger and financially stronger farmers who are earning a good return and want to upgrade their equipment, because they require reliable equipment to complete critical operations such as seeding and harvesting on time. Improved grain prices for the 1988 crop encouraged them to replace their equipment.

CANADA

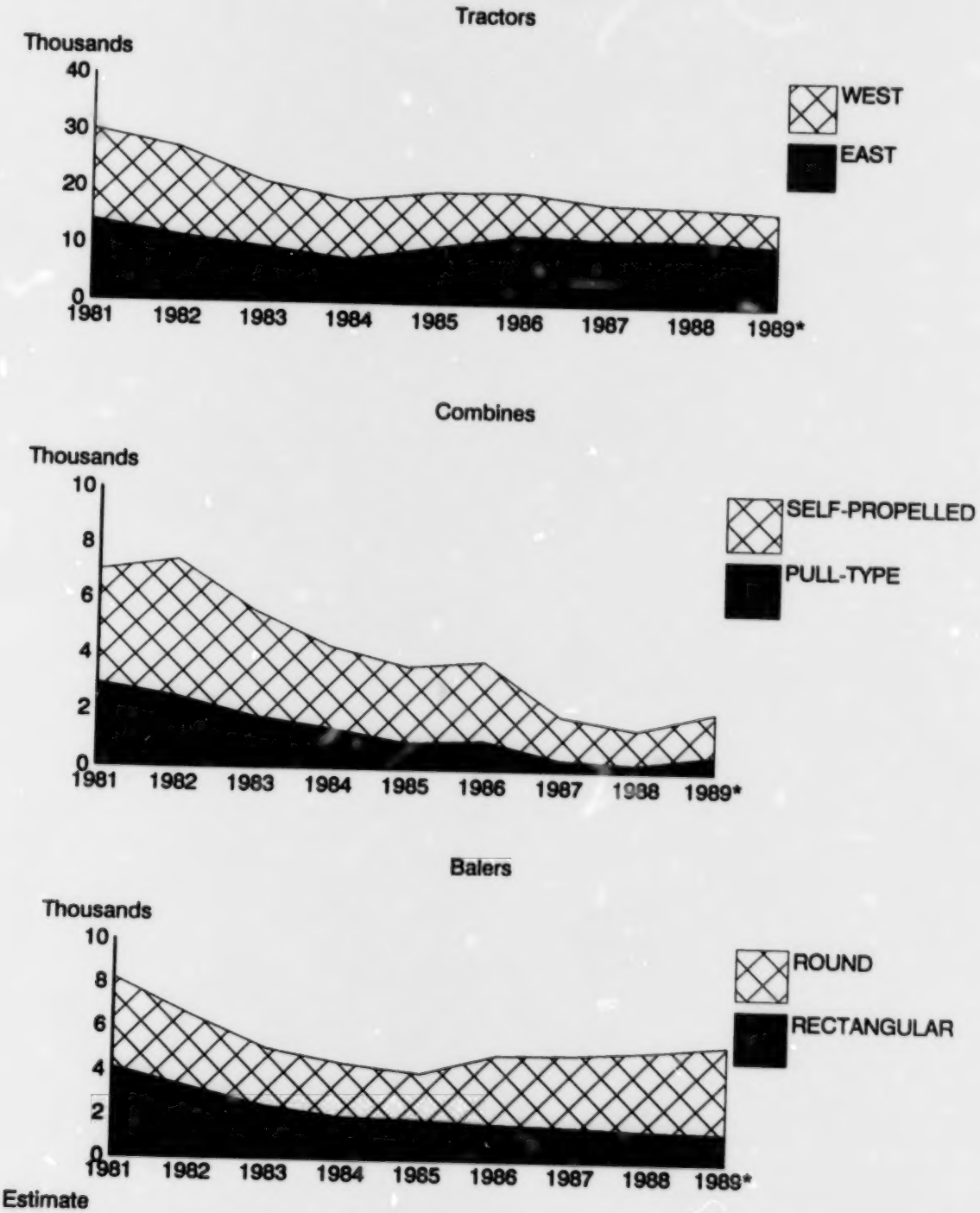
Demand

Canadian farmers in 1989 are projected to increase their capital expenditures by 2.4% in real terms. This small increase represents the third year in a row that annual capital expenditures have increased in real terms. This increase is made up of the combined effects of a 1% rise in building construction expenditures and a 3.8% increase in machinery purchases. Prices of these capital items in 1989 increased by 2% on average.

As in the United States, the improved demand in Canada for farm machinery started in 1987. The 1988 drought dampened demand in the second half of 1988 but the reduced supplies of grains and oilseeds led to rising prices for these agricultural products. The result was increased optimism, particularly in those areas with average or better crops in 1988. These farmers also enjoyed higher incomes. Machinery sales in the second half of 1988 continued firm and improved in 1989. As in the United States and for similar reasons, the market for large tractors has stayed strong throughout 1988 and the first half of 1989.

Total crop receipts are forecast to rise slightly in 1989, continuing the 1988 trend, and crop farmers are growing less dependent on government assistance payments. As a result, more farmers in 1989 were optimistic about future incomes. Agricultural land prices in all Prairie provinces increased in dollar value for the first time in a decade, which improved both farmers' equity and their ability to borrow in order to purchase new farm machinery. Agricultural land prices have increased in both dollar and real terms in all other regions, which improved the farm financial situation in the rest of Canada even more than on the Prairies. Nominal and real interest rates have been higher than in

Figure 2: FARM MACHINERY UNIT SALES, CANADA



* Estimate

Source: Canadian Farm and Industrial Equipment Institute, 'Industry Outlook'

previous years, but this did not lead to a significant reduction in demand for machinery, as farmers were using their own equity for the purchases. The running down of farm inventories of grains and oilseeds, government assistance progarms and increases in grain and oilseed prices in 1988 all contributed to an increased cash flow for farmers in the first half of 1989. Crops in 1989 have had higher yields than those in 1988 in most areas, but the quality is lower. Coarse grain and oilseed prices for the 1989 crop are expected to be well below the prices received for the 1988 crop, and wheat prices are expected to be down slightly.

The used equipment market has remained tight in 1989, and good tractors and other used machinery are hard to find. Dealer inventories are low, thus forcing some farmers to turn to new equipment. It is believed that many farmers continue to repair and upgrade the large inventory of equipment on their farms in order to extend its life and to cut costs. The net result is that new equipment sales have increased only moderately.

The 1989 Canadian current-dollar sales of farm machinery estimated by the Canadian Farm and Industrial Equipment Institute (CFIEI) are $1.82 billion, which is 7% above the 1988 level. When a comparison is made between sales during the period from January to October 1989 and those during the same period in 1988, unit sales of tractors decreased by 7.0%. Sales of tractors between 40 and 100 horsepower decreased by 16.7% and sales of tractors over 100 horsepower (two-wheel-drive and four-wheel-drive) increased by 29%. Unit sales of tractors under 40 horsepower decreased by 7.5% and inventories of these small tractors rose, causing considerable price competition in 1989. Unit sales of mower conditioners and balers were up by 7.1% and 5.1%, respectively. The increase in baler sales was all in the large baler section. Combine and swather sales recovered from their 1988 drought levels by 64.9 and 2.6%, respectively. In 1989, the markets for tillage and seeding equipment improved considerably. With greater use, these types of equipment wear out faster on today's larger crop farms. The livestock sector has remained relatively strong and so has the demand for equipment and buildings used in that sector.

Farm building construction increased in 1987 and 1988. Improved livestock incomes in 1989 are the main reason for an expected 4% increase in expenditure in farm building construction in 1989.

Supply

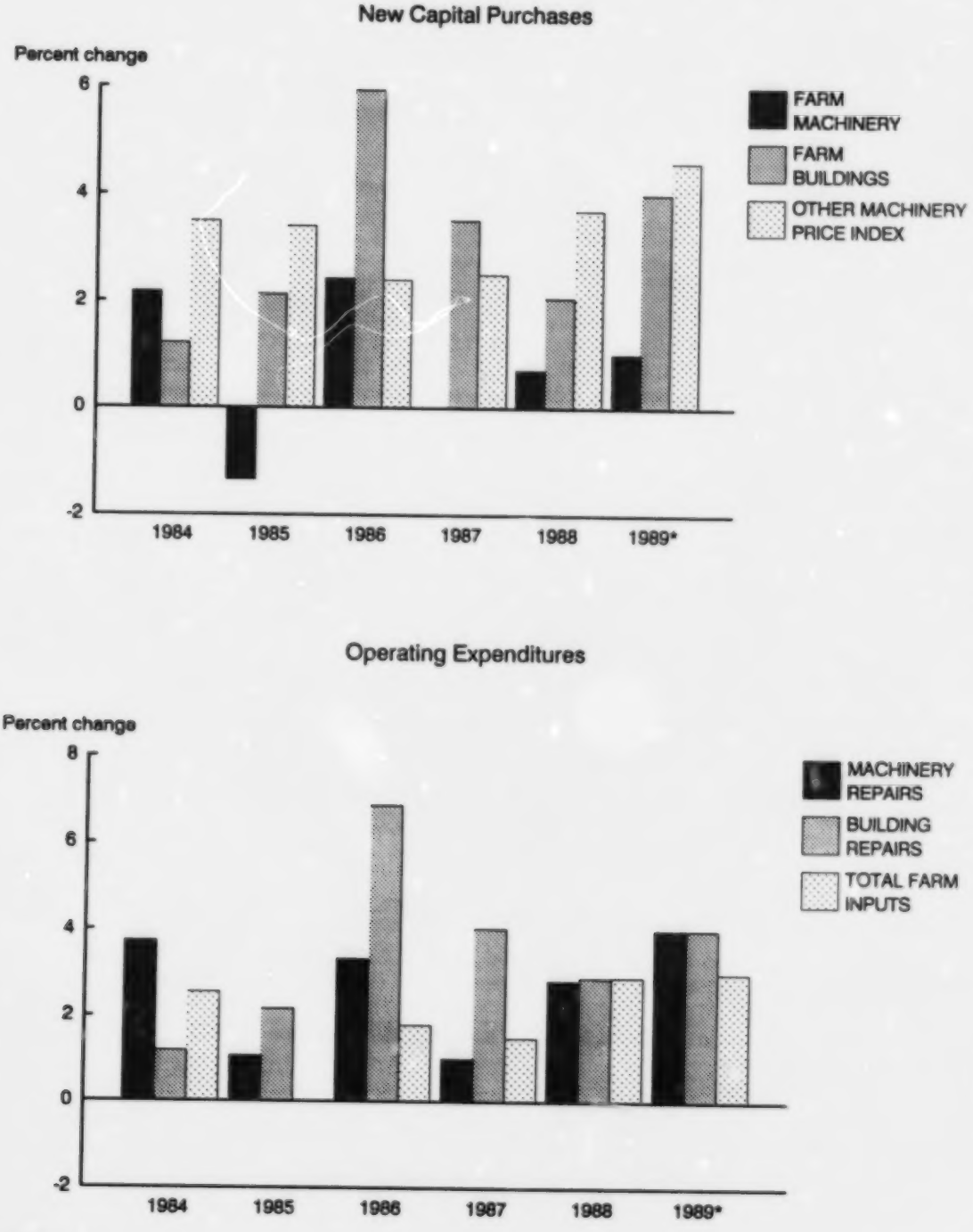
Shipments from Canadian farm machinery manufacturers are estimated to have increased by 20% in 1989, following a 3% decrease in 1988. This increase is due in part to the low sales in 1988 as a result of the drought and in part to the ability of many of the Canadian short-line companies to adjust to both domestic and export market needs.

Construction labor and materials for farm buildings were readily available in 1988 throughout Canada.

Prices

Canada is a small part of the OECD market for major machinery items, and market conditions in all the OECD countries influence Canadian prices. With only a small increase in OECD demand for major machinery items, prices generally have remained either stable or rose by 1% in 1988. In 1989, machinery prices are expected to rise by

Figure 3: PRICE CHANGES, CANADA



* Estimate.

Source: STATISTICS CANADA, Catalogue No. 62-004 and 62-001

1% as a result of increased demand. The market for tractors under 40 horsepower, where inventories are large, has experienced some price discounting and prices have dropped. Intensive competition in the parts market from auto suppliers and "will-fit" manufacturers is keeping down increases in the prices for the more generic parts, which represent the majority of part sales.

Construction prices increased by 2% in 1988 and are estimated to have increased by 4% in 1989. These increases are determined by the state of the construction industry in general rather than by farm construction activity (Table 1).

OUTLOOK

WORLD

The USDA released additional land from the acreage setaside program for crop production in 1989. Increased production, partly as a result of these releases, has increased grain and oilseed supplies worldwide and has decreased prices. Therefore, farmers in the United States are expected to marginally increase their machinery purchases in 1990. The European machinery market is not expected to change much in 1990. With a relatively tight used machinery market but uncertain times, farmers in the OECD countries will replace their equipment with new machinery only when it clearly appears really necessary or when the new machinery appears to provide significant economies.

The rationalization of the OECD farm machinery industry will slowly continue in 1990 because of low but steady sales volumes and relatively stagnant prices. Inventories and production capacity still need to be brought closer in line with sales levels, and this will increase the need for adjustment. Price increases will be moderate and large price discounts are less likely to occur. Dealer numbers will generally continue to decline, forcing some farmers to travel farther for parts and services.

CANADA

Demand

Some larger commercial farmers bought new large tractors and purchased land in 1989, in part because of the optimism associated with the higher prices for the 1988 crop.

Grain and oilseed in 1990 prices are forecast to go down, although total export sales, if there is a normal crop, are expected to increase. Realized net farm income in 1989 is likely to be lower because of increased input costs. Farmers are not likely to have as good income expectations entering 1990 as they had at the start of 1989. The general economy is expected to slow its rate of growth to 1.8% in 1990, and interest rates (both real and nominal) are expected to stay high. Therefore, the demand for farm machinery is expected to decrease by 2 to 4% in 1990. This decrease will be relatively similar in both western and eastern Canada.

The value of parts sales will likely stay fairly constant in 1990 at its current relatively high level.

Because of the less certain environment, new construction on Canadian farms in 1990 will remain at the same level, in constant dollar terms, as in 1989. Building repairs are expected to remain constant at their relatively high 1989 level.

Supply

Although manufacturer and dealer inventories of new farm machinery are estimated to be down in 1989, there is still overall surplus production capacity in the industry in OECD countries. Therefore, no shortages of farm machinery are forecast for 1990.

With the slower growth in the economy in 1990, residential and nonresidential construction is not expected to increase. Therefore, construction materials and labor should be in good supply next year.

Prices

Next year will see a drop in machinery sales of up to 2% in current dollar terms after two years of small increases. As a result, machinery prices will likely rise by less than the rate of inflation. Weak demand and worldwide surplus supplies of the major machinery items are expected to restrain increases in prices in 1990. The net effect would be a 1 to 3% increase in machinery prices. This would mean a 2 to 4% decrease in machinery sales in real terms.

The prices of materials and services used in construction are expected to rise by 3% as the result of construction price rises in the general economy as a whole. As the forecast is for 2 to 3% rise in the current dollar value of construction on Canadian farms, there would be little or no change in the real level of construction expenditures by Canadian farmers.

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TABLE 1 CANADIAN FARM MACHINERY SALES, SELECTED PRICES, AND FARM INCOME, 1982-86

	1982-86 average	1987	1988	1989[h]
Capital expenditures[a] ($ million)				
Current	3 758.80	3 282.90	3 409.20	3 550.00
Constant (1981)	3 313.04	2 741.20	2 792.80	2 860.00
Annual change in constant $ (%)	-10.48	2.82	1.88	2.41
Total farm capital ($ billion)	121.20	104.46	103.38	105.00
Canadian machinery sales[b] ($ million)				
Current	1 726.40	1 600.00	1 700.00	1 800.00
Constant (1981)[c]	1 558.71	1 404.74	1 482.13	1 538.54
Annual change in constant $ (%)	-5.30	-6.43	5.51	3.81
Shipments ($ million)	939.68	875.70	850.14	1 033.00
Farm cash receipts ($ million)	19 649.43	21 068.36	21 933.06	22 398.10
Realized net farm income ($ million)				
Current	3 150.74	4 425.17	4 890.24	4 135.10
Constant (1981)[d]	2 581.32	3 202.00	3 400.72	2 734.85
Interest rate (%)				
Prime	12.03	9.52	10.83	13.25
Real rate[e]	6.22	5.14	6.78	8.10
Prices (annual % change)				
Consumer price index	5.80	4.38	4.05	5.15
Total farm inputs[f]	1.63	1.48	2.91	3.00
Farm machinery replacement[f]	2.67	0.00	0.70	1.00
Building replacement[f]	5.11	3.52	2.04	4.00
Ratios (%)				
RNI to FCR[g]	15.99	21.00	22.30	18.46
Capital expenditures to FCR	19.20	15.58	15.54	15.85
Capital expenditures to RNI	121.84	74.19	69.71	85.85

a Statistics Canada, Fixed Capital Formation of Farm Machinery, Motor Vehicles and Buildings.
b Sale of farm machinery items covered by CFIEI surveys, valued at dealers' buying prices before deduction of dealers' cash discounts.
c Deflated by the machinery replacement index.
d Deflated by the consumer price index.
e Adjusted for inflation by subtracting annual changes in the consumer price index.
f Farm input price index.
g RNI = realized net farm income; FCR = farm cash receipts.
h Estimated; RNI and FCR are Agriculture Canada's June forecast. more recent forecasts are available now.

Sources: Agriculture Canada, Market Commentary; Bank of Canada, Review, 1987; CFIEI, Industry Outlook and Update 1987; Statistics Canada.

ENERGY

A. Asselstine

HIGHLIGHTS

The average price Canadian farmers pay for diesel fuel and gasoline will increase by 10 to 13% in 1990, mainly because of reduced rebates and increased taxes. This increase is forecast despite a small drop in crude prices. As farm consumption should remain constant, petroleum expenses are expected to raise by 10 to 13%. Heating fuel expenses will decrease by 2 to 4%.

In 1990, electricity rates and farm electrical expenses are expected to rise by 4%.

SITUATION

WORLD

Petroleum supply and demand

World consumption of crude oil continues to increase, rising from 7.83 million cubic metres per day in 1987 to 8.28 million cubic metres per day in 1989 (Table 1). Production has kept pace, keeping stocks at manageable levels. Crude oil supply increased from 7.72 to 8.41 million cubic metres per day during the same period. Refinery capacity has stayed constant and so refinery utilization rates have increased, which may result in tight supplies in some petroleum product markets.

In 1988, increases in consumption were compensated for by increased production, particularly from the Organization for Petroleum-Exporting Countries (OPEC). As a result, international petroleum prices decreased slowly through 1988 to the US $14 per barrel level. In the first quarter of 1989, North Sea production outages and the Exxon Valdez oil spill sparked a price increase. This price increase continued through the first half of 1989 well after the Port of Valdez had reopened. The gradual increase in consumption was considered the main reason for the substantial price increase. Prices peaked in the early summer and have been slowly decreasing since then.

CANADA

Energy demand

In 1988, total domestic consumption of all forms of energy was 4.5% higher than year-earlier levels. This was the result of increased use of all the major forms of energy: petroleum products, natural gas, coal and electricity. The increased consumption of petroleum products over recent years has not been accompanied by increased refinery capacity. As a result, refinery utilization rates have increased. First-quarter refinery

utilization rates were 83% in 1987, 84% in 1988 and 87% in 1989. Although petroleum products met only 39.5% of domestic primary energy demand in 1988 (compared with 50.6% in 1980), this was still the leading form of energy used in Canada, followed by natural gas (25.5%), electricity (15.3%), coal (14.6%), and others (5.1%) (Figure 1).

Energy prices

Canadian crude oil prices, which are governed by international prices, decreased throughout 1988. In the first half of 1989, crude prices increased by around 30%. The price of crude in Montreal fell from $135.84 per cubic metre in January 1988 to $103.52 per cubic metre in November 1988, and then rose to $149.39 in July 1989 (Figure 2). Edmonton crude oil prices also fell throughout 1988 to a low of $94.14 per cubic metre in December, followed by increases to $139.64 in July 1989.

Crude oil prices, federal and provincial taxes and oil company margins (refining and marketing costs and profits) are the components that make up the general retail prices of gasoline and diesel fuel in Canada. In 1988, oil company margins increased by 10%, fuel taxes remained relatively constant and crude oil prices fell, resulting in a small drop in the retail prices of gasoline and diesel fuel. In 1989, crude prices, taxes and oil company margins increased, causing retail gasoline and diesel fuel prices to rise 6.2 cents per litre and 2.6 cents per litre, respectively, between January and September.

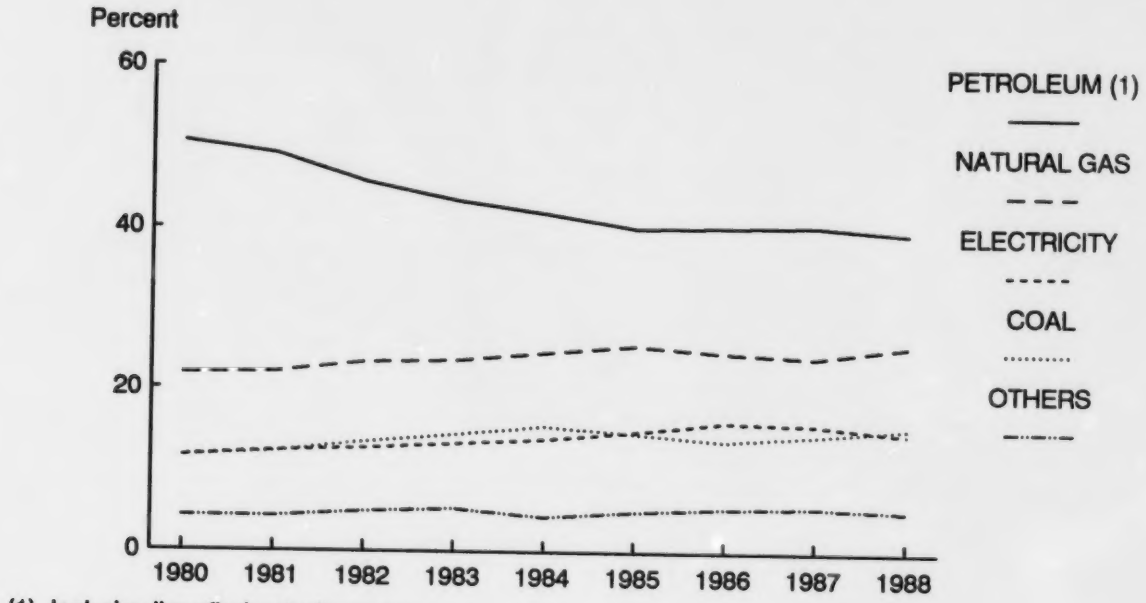
The price of natural gas fell during 1988 and the first half of 1989, whereas electricity prices registered steady gains in 1988 and 1989.

Energy and agriculture

The main energy products used by farm businesses are diesel fuel, gasoline, electricity, natural gas, heating oil and propane. Farm use of any of these products is a small proportion of the total Canadian consumption of these products (Table 2). Only in the Prairie region is the farm sector a significant market for diesel fuel, the main energy product used by farmers. Therefore, purchases by farmers have little effect on the overall supply and demand situation for these energy products or on their prices.

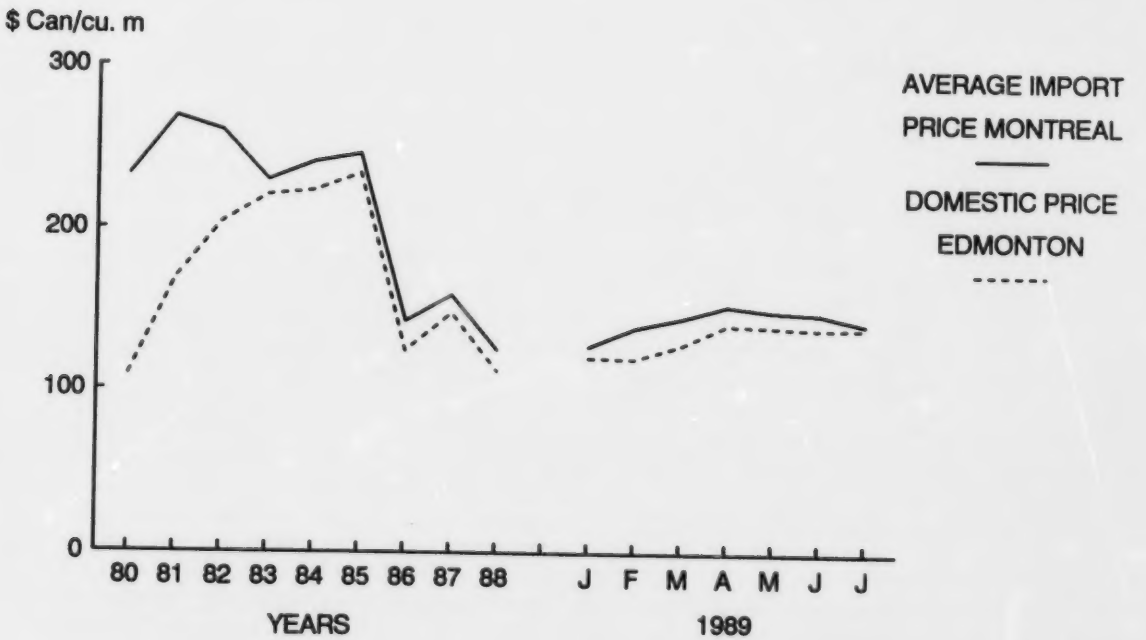
Prices paid by farmers for bulk purchases of diesel fuel and gasoline delivered to the farm differ from urban retail prices because of fuel tax rebates and because of the different cost structures. However, Saskatchewan and Alberta data suggest that the retail price less rebates is a relatively good approximate of farmgate diesel fuel and gasoline prices. In 1989, the federal government rebates were 10.0 cents per litre on regular unleaded gasoline and 7.5 cents per litre on diesel fuel (Table 3). This rebate level exceeded the federal taxes on diesel fuel and fully compensated farmers for the sales and excise taxes on unleaded gasoline, except for the 1-cent-per-litre increase in the excise tax introduced in April 1989. Provincial sales tax rebates range from 5.6 to 14.4 cents per litre for regular unleaded gasoline and from 5.6 to 12.5 cents per litre for diesel fuel. In all provinces but British Columbia, these rebates are equal to the provincial sales taxes. In Alberta and Saskatchewan, farmers receive additional assistance with respect to farm fuel purchases. In Alberta this assistance is 14 cents per litre on diesel fuel and 9 cents per litre on gasoline. In Saskatchewan this assistance is 2 cents per litre for both fuels. As a result, Alberta has the lowest net farm fuel prices in Canada. The fuel tax rebates are provided to farmers either through a rebate or through purchases of fuel exempt from taxes. Federal fuel tax rebates and the rebates from all provinces but Alberta are for off-highway use only, so most Canadian farmers buy some fuel at retail prices.

Figure 1: SHARE OF DOMESTIC ENERGY CONSUMPTION BY FUEL TYPE



(1) Includes liquefied petroleum gas.

Figure 2: CRUDE OIL PRICES, CANADA



In August 1989, estimated net farm prices of regular unleaded gasoline ranged from 24.1 to 38.7 cents per litre, while those for diesel fuel ranged from 12.6 to 37.9 cents per litre (Table 3). Removing the effects of higher levels of provincial assistance provided in Alberta and Saskatchewan reduces the extent of price variations considerably. The remaining variation is due to different crude costs and marketing conditions. The estimated farm prices presented in Table 4 are retail prices less rebates and so are not actual farmgate prices. In Alberta and Saskatchewan, there were farm fuel price wars in 1987 and 1989, when farm fuel prices dropped close to the retail prices of fuels less taxes. Figure 3 compares Regina bulk farm fuel price according to the Saskatchewan provincial farm price survey with Regina retail prices less rebates.

Heating fuel prices are close to farmgate diesel fuel prices because of the similarity of these products. The price of electricity moved up in 1988 and 1989, while the prices of natural gas and propane fell during the same period (Table 4). The prices of these products are determined by the total provincial or North American market for these products.

The farm input price index (1981 = 100) for petroleum products decreased through 1988 to 100.0 in the fourth quarter (Figure 4). In the first quarter of 1989, this index dropped to 98.6, reflecting the farm fuel price war but, in the second quarter, the index rose to 100.7. The price index for electricity increased from 145.7 in the second quarter of 1988 to 153.3 in the second quarter of 1989, a rise of more than 5%.

OUTLOOK

WORLD

Petroleum supply and demand

World consumption of petroleum products is forecast to continue to grow at a rate of about 2% per year over the next few years. There will be a lower rate of growth in the first half of 1990 because of the expected slowed growth in the member countries of the Organization for Economic Cooperation and Development (OECD), particularly in North America. This slow but steady increase in international consumption of petroleum will likely be met by increased production by members of the Organization of Petroleum Exporting Countries (OPEC), who have consistently produced over their quotas in the recent past and so are expected to continue to do so over the next few years. The result will be a closer alignment between production and consumption.

Refinery utilization rates will continue to rise as production and consumption increase with no planned increase in refinery capacity. The shortage of refinery capacity will be most acute in North America. Modifying the refinery or the refining process will make up for any short-term shortages of capacity. The risks associated with pending environmental regulations are discouraging investments in refineries.

Crude oil prices responded quickly to the supply problems in the first quarter of 1989 before they started to decline in the second half of 1989. This decline is expected to continue into 1990, when crude oil prices are expected to fluctuate around US $17 per barrel, basis West Texas intermediate. This would be about 8% below the average price anticipated for 1989. The Conference Board forecasts a 7% increase in crude prices in 1991. Despite this relative stability in average projected annual prices, the close balance of supply and demand mean that small disruptions in supply could lead to sharp fluctuations in prices, as was the case in 1989.

Figure 3: DIESEL FUEL PRICES, REGINA

MONTHLY

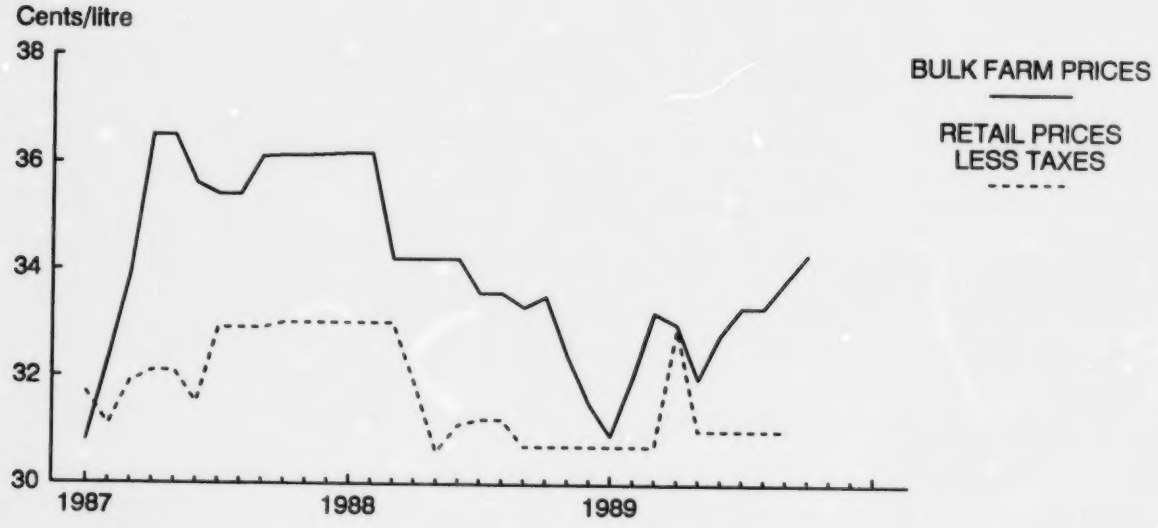
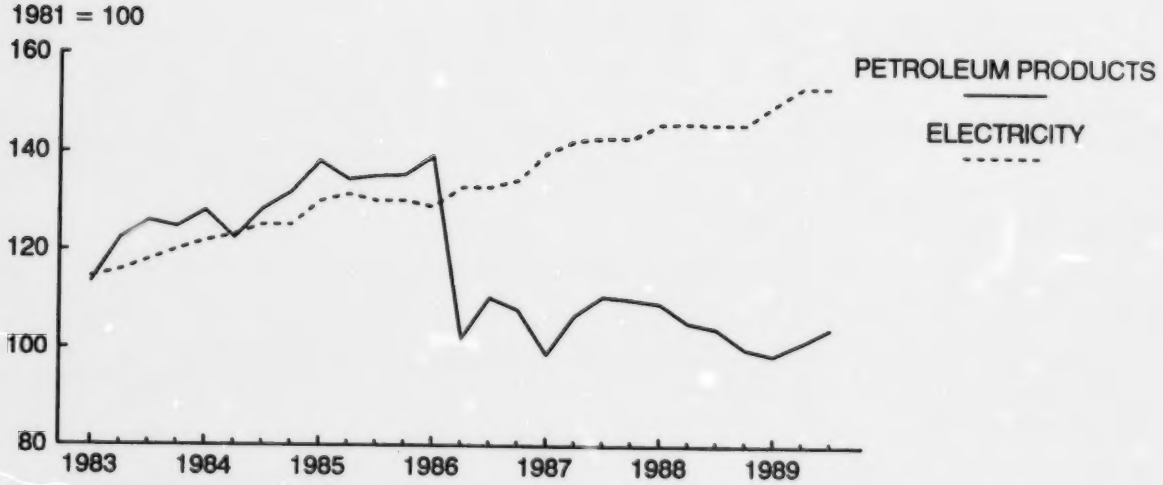


Figure 4: FARM INPUT PRICE INDEX, CANADA

QUARTERLY



Source: STATISTICS CANADA, Catalogue No. 62-004
, 'Farm Input Price Index.'

CANADA

Energy demand and prices

General economic activity in Canada is expected to weaken to a 1% growth rate in the first half of 1990 before improving slightly in the second half of 1990. Therefore, the growth in demand for energy products is expected to increase by only 1.4%, according to the Conference Board of Canada.

In line with world crude oil price changes, the Conference Board forecasts Canadian crude oil prices to decrease by 8.2% in 1990. With high refinery utilization rates, Canadian refiners will likely improve their margins. A 1-cent-per-litre increase in the federal excise tax on gasoline is scheduled for January 1, 1990, which will result in a 2% increase in gasoline prices. Aggregate retail prices (including taxes) of refined petroleum products could therefore decrease by 2 to 5%. Electricity rates are expected to rise by more than 4%, with the actual increase varying by province. The North America natural gas market will have slightly tighter supply situation and so prices are expected to increase by 1 to 2%.

Energy and agriculture

The Grains and Oilseeds Branch of Agriculture Canada forecasts no major change in the total area planted to grains and oilseeds in Canada in 1990. Farm use of petroleum products occurs mainly in the production of grains and oilseeds; therefore consumption of petroleum products by farmers should remain relatively constant. There were farm fuel price wars in the Prairie region in 1989 and 1987, but not in 1988. These price wars saved farmers 2 to 3 cents per litre. With higher refinery utilization rates, the possibility of farm fuel price wars in 1990 is reduced.

On December 30, 1989, the federal excise tax rebate on farm fuels will terminate, resulting in a 4-cent-per-litre increase in the net cost to farmers of diesel fuel and a 5-cent-per-litre increase in the net cost of gasoline as of January 1, 1990. As well, there will be a 1-cent-per-litre increase in the federal excise tax on gasoline. Since farmers pay lower net prices than most Canadians, the effects of these rebate and tax charges will be increases in farm fuel prices in the range of 13 to 30%. Taking into consideration the possible 2 to 5% decrease in retail prices and the effects of the tax and rebate changes, the average net cost per litre of fuel used by farmers is expected to increase by 10 to 13% in 1990. The percentage price change for farmers will be higher for the portion of their fuel purchases that are exempt from tax and in those provinces like Alberta that have relatively low per litre fuel prices. As fuel consumption will stay relatively constant, fuel expenses will increase by 10 to 13%.

Since heating fuel is not subject to the federal excise tax, heating fuel costs will decrease by 2 to 4%.

In 1990, no change in farm consumption of electricity is expected. This item of expenditure should therefore increase by about 4%, in line with the anticipated increase in electricity rates.

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TABLE 1 CRUDE OIL CONSUMPTION AND SUPPLY OUTSIDE THE COMMUNIST BLOCK

		1983	1984	1985	1986	1987	1988	1989[a]
		(millions of cubic metres per day)						
I)	Consumption							
	OECD	5.40	5.50	5.47	5.63	5.72	5.88	5.98
	Non-OECD	1.88	1.92	1.97	2.03	2.11	2.21	2.30
	Total	7.28	7.42	7.44	7.66	7.83	8.09	8.28
II)	Supply[b]							
	OPEC	2.94	2.94	2.78	3.15	3.11	3.43	2.57
	OECD	2.54	2.65	2.70	2.67	2.67	2.64	2.57
	LDCs	1.19	1.27	1.37	1.37	1.37	1.48	1.51
	CB exports	0.27	0.30	0.29	0.32	0.33	0.35	0.35
	Total[c]	7.08	7.32	7.33	7.67	7.72	8.07	8.41
Change in inventories		(0.19)	(0.10)	(0.11)	0.01	(0.11)	(0.02)	0.13

Abbreviations:
OECD - Organization for Economic Cooperation and Development
LDC - Less developed countries
OPEC - Organization of Petroleum-Exporting Countries
CB exports - Communist block exports to the rest of the world.

a Estimated in mid-1989
b Includes natural gas liquids
c Includes gains during the refinery process

Source: International Energy Agency.

TABLE 2 ENERGY USE[a] - 1987 AND 1988

	Share of farm energy expenses	Year	Canada total use	Farm use[b]	Farm use as a share of total use
	(%)				(%)
Diesel fuel (millions of litres)	40	1987	15 841[c]	1 690	10.7
		1988	16 644	1 532	9.2
Gasoline (millions of litres)	35	1987	33 215	1 355	4.1
		1988	34 055	1 354	4.0
Electricity (gigawatt hours)	15	1987	403 393	5 164	1.9
		1988	423 540	5 830	2.1
Natural gas (millions of cubic meters)	3.5	1987	44 875	428	1.1
		1988	49 686	548	1.1
Heating fuel (millions of litres)	3.5	1987	13 797	179	1.3
		1988	15 585	179	1.1
Propane (millions of litres)	3	1987	4 453	230	5.1
		1988	5 037	230	4.6

a Energy use is direct use only. The Canadian total use excludes conversion to other forms of energy and energy used in the production and transport of the energy.

b Estimated by adjusting the 1981 farm energy use survey data for 1987 and 1988 area and increased proportion of diesel engines.

c Prairie farmers use 73% of the diesel fuel used by Canadian farm businesses.

Source: Energy Statistics Handbook.

TABLE 3 MOTOR FUEL PRICES[a], BY PROVINCE, AUGUST 29, 1989

	Vanc.	Calg.[c]	Regina[c]	Winn.	Tor.	Mont'l	Saint John	Halifax	Charl.	St. John's	Canada
						(¢/L)					
Diesel fuel:											
Retail price	44.6	39.1	47.7	46.4	47.1	52.0	46.7	50.0	49.8	57.7	49.0
Taxes and rebates[b]											
Federal sales tax	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	
Rebate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Federal excise tax	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Rebate	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Provincial sales tax	8.7	5.0	10.0	9.9	10.9	12.5	11.4	8.8	9.3	12.3	
Rebate[c]	5.6	19.0	12.0	9.9	10.9	12.5	11.4	8.8	9.3	12.3	
Estimated Farm Price[d]	32.3	12.6	28.2	29.0	28.7	32.0	27.8	33.7	33.0	37.9	24.6
Unleaded regular gasoline:											
Retail price, city	54.3	48.1	53.8	50.6	53.5	58.1	53.9	52.3	54.0	56.7	54.3
Taxes and rebates[b]											
Federal sales tax	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Rebate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
Federal excise tax	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
Rebate	6.5	6.5	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Provincial sales tax	11.3	5.0	10.0	8.0	10.3	14.4	10.4	8.9	9.1	10.7	
Rebate	5.6	14.0	12.0	8.0	10.3	14.4	10.4	8.9	9.1	10.7	
Estimated Farm Price[d]	38.7	24.1	31.8	32.6	33.2	33.7	33.5	33.4	34.9	36.0	30.28

a Prices are the average price for the city at self-serve pump except for Saint John and Halifax, where full-service pumps were surveyed.

b Rebates are for off-highway use only except in Alberta where the rebates are for all farm business use. The federal rebates are restricted to 80% of fuel purchases unless proof of greater on-farm use is provided.

c In addition to the sales tax rebate, Alberta provides rebates of 9¢/litre for gasoline and 14¢/litre for diesel fuel, and Saskatchewan has a 2¢/litre oil royalty tax refund.

d The estimated farm price is the retail price in the major city adjusted for tax rebates and exemptions.

TABLE 4 SELECTED ENERGY PRICES[a], CANADIAN AVERAGE

	1985	1986	1987	1988	1989
Electricity, residential (¢/kwh)	5.04	5.17	5.39	5.61	5.71 (March)
Retail gasoline, regular unleaded (¢/L)	53.5	47.7	50.1	49.3	53.10 (June)
Retail diesel fuel (¢/L)	47.5	46.1	46.7	47.1	48.60 (June)
Natural gas, residential (¢/m^3)	18.65	18.88	18.60	18.38	17.69 (April)
Propane, FOB Alberta ($/$m^3$)	110.16	84.61	59.61	48.40	44.61 (March)

a Includes taxes, except for propane

Source: Energy Statistical Handbook.

FERTILIZER

M. Spearin

HIGHLIGHTS

World consumption of fertilizer in 1989-90 is expected to grow by 3% as crop area is expanded to replenish grain stocks. In addition, fertilizer prices have dropped. Fertilizer prices should move higher by the spring of 1990 when currently high fertilizer inventories are cleared.

Fertilizer consumption could increase by 2 to 4% in Canada. Retail prices will likely remain the same or increase by 1% relative to the levels of the spring of 1989.

SITUATION

WORLD

Supply-demand balance

Consumption

World consumption of fertilizer is expected to increase 2.5 to 3% for the fertilizer year July 1988 through June 1989. In June 1989, it was projected that world consumption of primary plant nutrients would increase by 3 to 5% in 1988-89 as a whole. However, the rapid growth in North American and international purchases of fertilizer materials in the first six months of the 1988-89 fertilizer year did not continue. China decreased purchases during the second half of 1989.

The growth in global fertilizer use slowed down considerably during the 1980s. Compared with 8.9% annual growth in the 1960s and 5.6% annual growth in the 1970s, global fertilizer use increased at only 2.6% per annum during the 1980s. Not all regions experienced a slowdown of growth in fertilizer use during the 1980s. Asia and the USSR experienced more than 5% annual growth in their fertilizer use and were thus the prime contributors to the growth in global fertilizer use. Western Europe dominated the fertilizer scene in the 1960s, North America in the 1970s, and Asia in the 1980s (IFDC 1989).

Fertilizer consumption in the United States was expected to increase by about 10% in 1989 following the 1988 drought, which reduced the production of grains and oilseeds, decreased grain reserves and raised prices of most major crops. These developments led to the prospect of up to 30 million additional planted acres in 1989 if setaside programs were eliminated (Childers 1989).

However, in the spring of 1989, coarse grain and oilseed prices weakened creating uncertainty in the farm sector. The increase in planted crop acreage was less than expected. The late dry spring in the western cornbelt and the late wet spring in the eastern cornbelt resulted in decreased fertilizer application (Childers 1989). Soil phosphate and potash reserves were high going into 1989 as a result of poor crop growth during the 1988 drought. The outcome is that U.S. fertilizer consumption in 1989 is expected to be only 5% above 1988 levels. Most of the increase is due to increased corn and wheat plantings.

Production

Accurate world fertilizer production data are not available for the current year. On a worldwide basis, 69 countries have some capability to produce nitrogen and 52 produce phosphoric acid. There are 13 countries that produce potash and 120 that consume it. Surplus capacity exists in the potash industry (Childers 1989). World trade in all three nutrients increased about 5% each in 1988-89.

The United States is a key factor in, and reflects, world and Canadian fertilizer supply and price movements. United States fertilizer production expanded for each of the primary plant nutrients during 1988-89 in response to higher fertilizer prices and expected greater use. Nitrogen production rose by 5% during the period from July 1988 to May 1989, relative to the year-previous period, because many anhydrous ammonia producers operated near maximum capacity. Phosphate production advanced by 4% in response to continued strength in the export market; potash production rose 7% (USDA 1989). United States inventory levels of all fertilizer materials rose substantially by June 1989 relative to year-earlier levels.

Prices

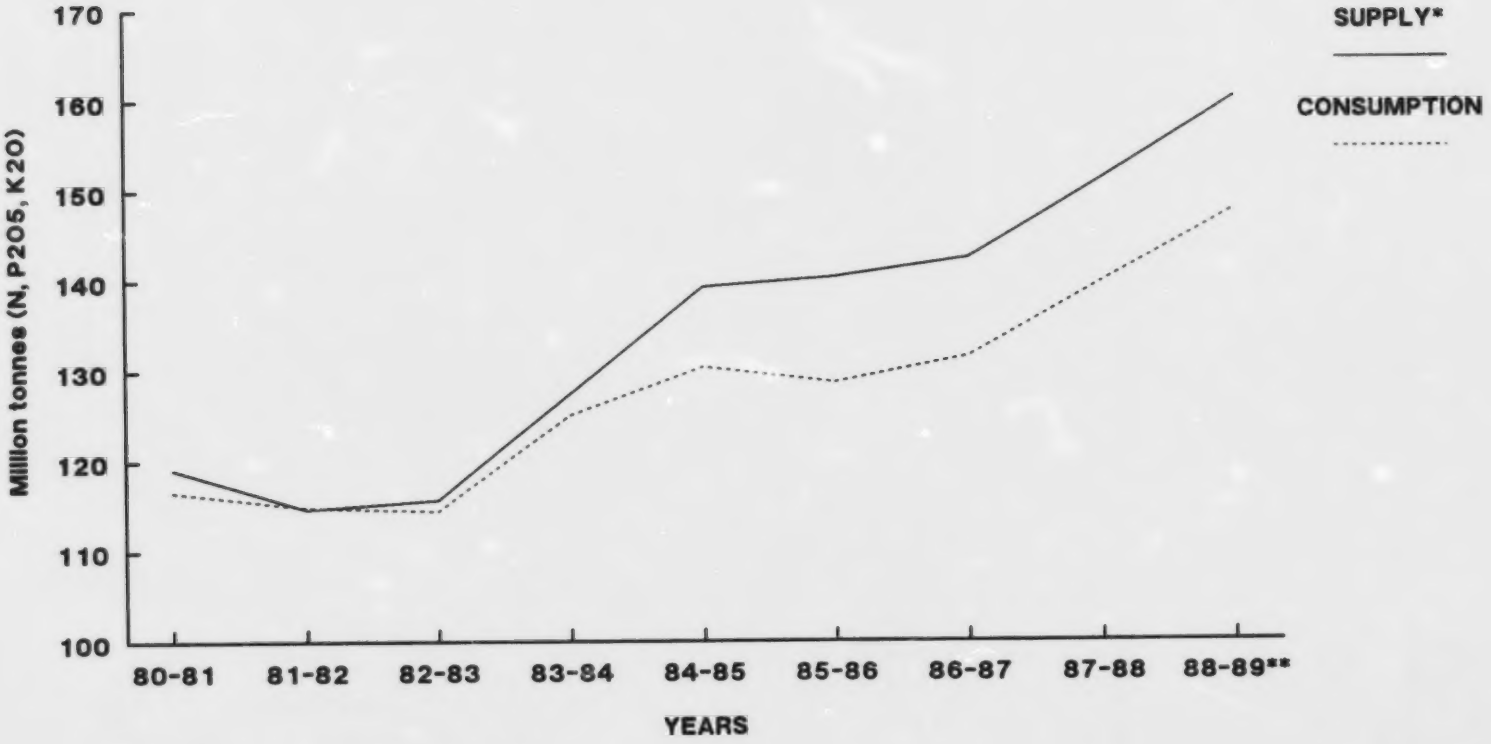
U.S. fertilizer supplies were tighter primarily because of greater U.S. demand in the fall of 1988 and spring of 1989. As a result, retail prices were higher during the main application season. Aggregate U.S. farm fertilizer prices in spring 1989 increased by 7% relative to the levels of the year-earlier period and by 5% since October 1988. The rise marked the third consecutive annual increase in fertilizer prices; the prices paid index for fertilizer has risen steadily since the fall of 1986. However, average prices paid remained more than 4% below the peaks of the early 1980s (USDA).

Nitrogen prices showed the greatest gain from the levels of the last quarter of 1988, with anhydrous ammonia prices climbing more than 17% by April 1989 as a result of increased domestic use. Prices of other nitrogen materials also increased from between 4 and 13%. Triple superphosphate and diammonium phosphate prices also rose (USDA).

In mid-April 1989 selling prices collapsed once distributors realized planting conditions were poor. Inventories were dumped on the market, knocking U.S. wholesale prices down by as much as 40% from early 1989 levels. The price of nitrogen products dropped to US$70/t from about US$130/t. Prices for phosphate - a minor fertilizer for production in Canada, as one of the raw materials for its production must be imported - dipped from US$175/t to US$145/t. Potash prices fell only marginally.

Figure 1

WORLD CONSUMPTION AND SUPPLY OF COMMERCIAL FERTLIZERS/FERTILIZER YEARS



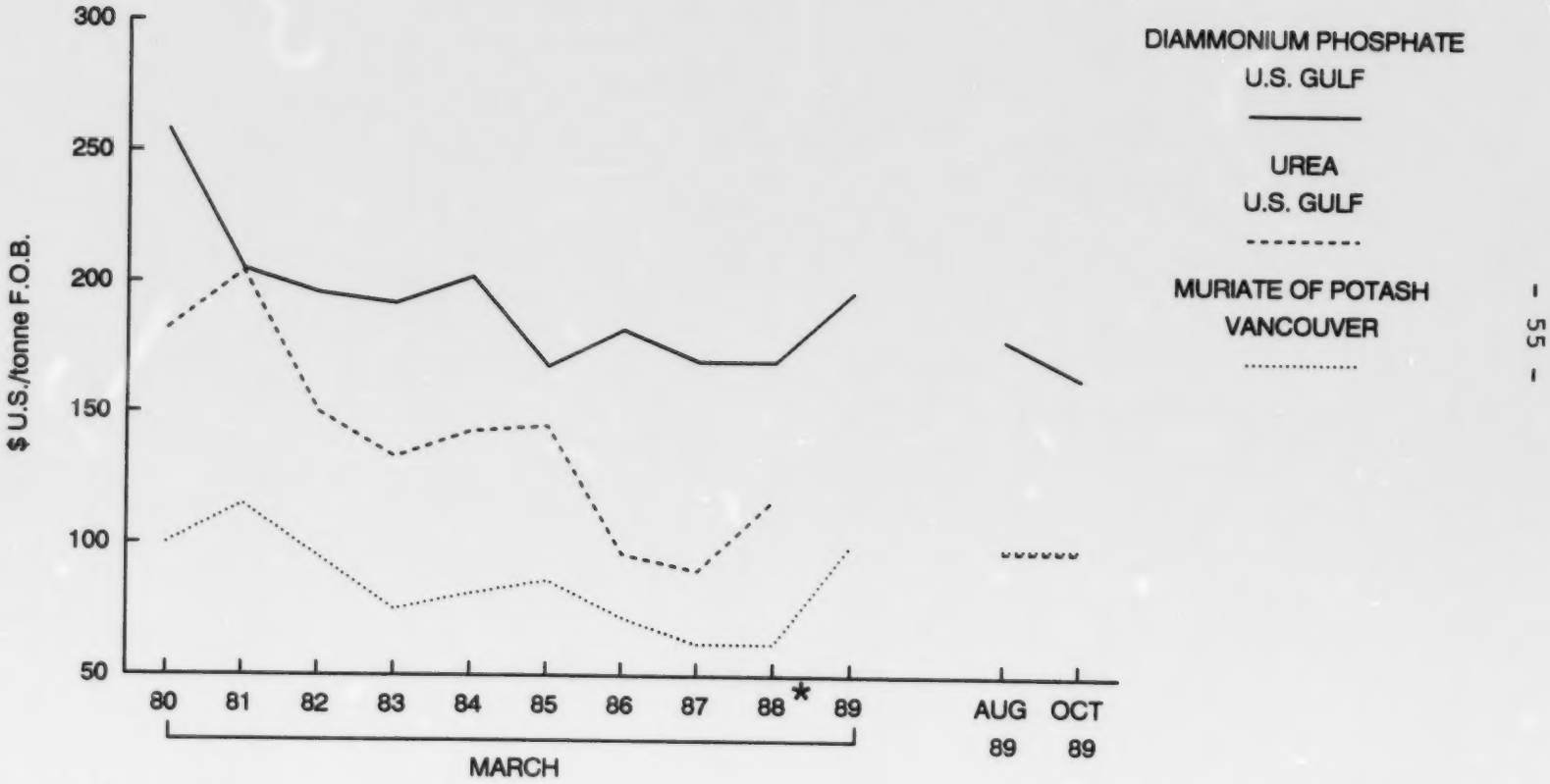
* Production and stocks

** Estimate

Source: FAO (Food and Agriculture Organisation)

Figure 2

INTERNATIONAL SPOT PRICE TRENDS OF SELECTED FERTILIZER MATERIALS



* Beginning February prices

Source: 'Green Markets'

CANADA

Consumption

The value of fertilizer sales in Canada for the fertilizer year ending June 30, 1989, rose as a result of price appreciation. Preliminary consumption estimates for 1988-89 indicate a 2% decrease in Canadian fertilizer consumption in both eastern and western Canada (Figure 3). Ontario, Manitoba and Saskatchewan were primarily responsible for the decrease because of adverse moisture conditions at the time of planting.

Regionally, Maritime consumption is believed to have decreased by 3%, Quebec consumption was unchanged and that in Ontario was down by about 5%. Contributing factors in Ontario included a late and wet spring (compared with weather conditions of the last few years), which interfered with corn planting, and a slight increase in the area planted to soybeans, which do not utilize a large amount of fertilizer.

Manitoba fertilizer use was down by more than 10% because the residual carry-over in the soil was quite high, as the drought prevented the bulk of the nutrients from being absorbed in 1988. In addition, farmers were reluctant to spend money on fertilizers on soils that were relatively dry at planting time. The rains came after seeding around the end of May. Similarly, use in Saskatchewan was down 9%, again because of dry weather early in the spring season.

Fertilizer consumption increased by 7% in Alberta, where general optimism because of better grain and oilseed prices and good seeding weather stimulated spring application of fertilizer. British Columbia also experienced a large increase in fertilizer use. Overall sales in western Canada in 1988-89 are expected to be down 2.5% to 2.44 Mt. Fertilizer sales in western Canada have not increased much since 1983-84.

Production and marketing

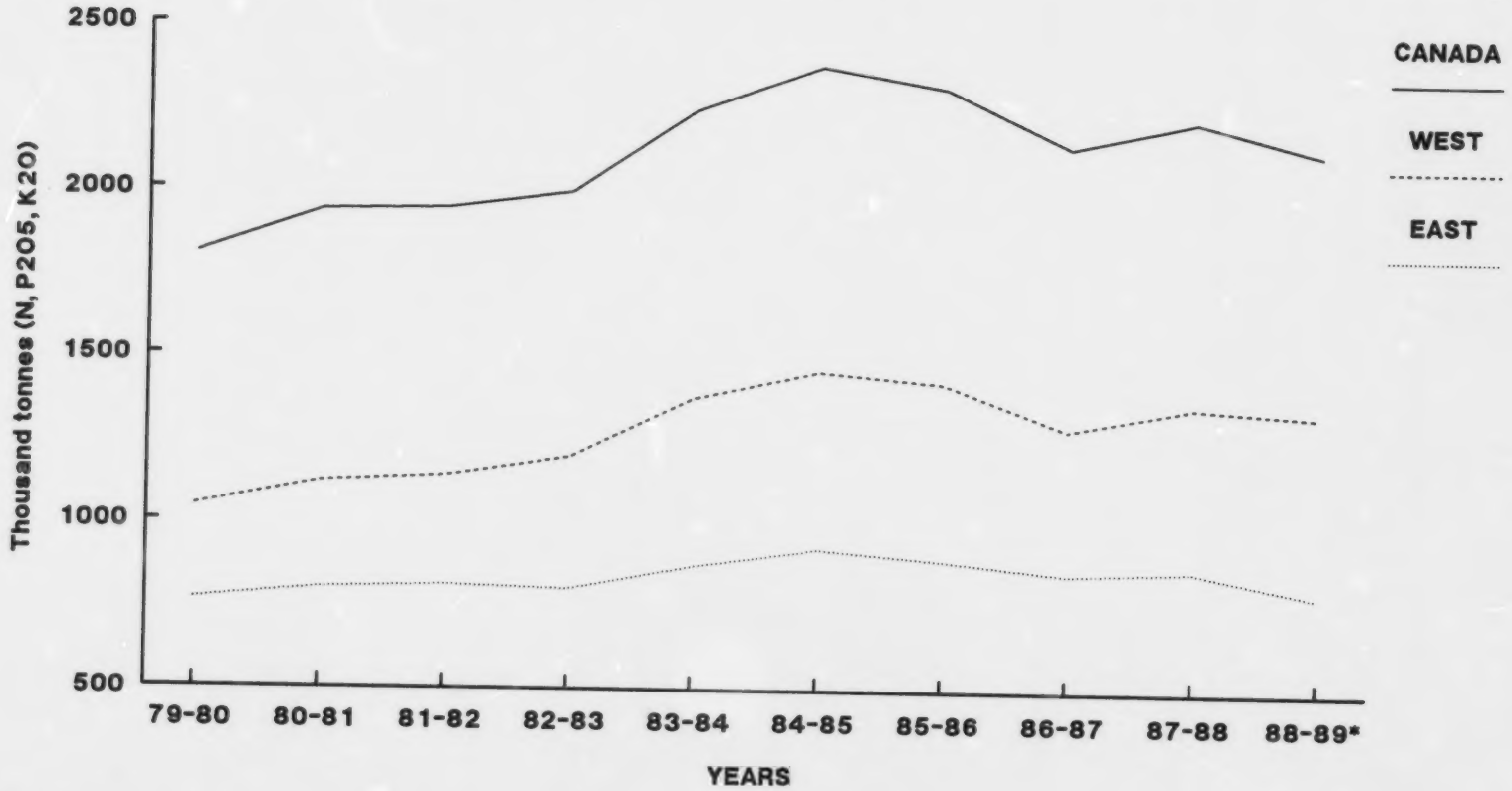
The Canadian fertilizer industry shipped 17 Mt of fertilizer product in 1988-89 of which 3.2 Mt was to the domestic market and approximately 14 Mt went to the United States and offshore markets. "Fertilizer product tonnes" include the actual plant nutrient content as well as binder or filler such as clay. "Nutrient tonnes" reflect the nutrient content of the fertilizer, which ranges from 20 to 80%, depending on the fertilizer type.

Nitrogen

Canadian anhydrous ammonia production increased by 12% in the 1988-89 fertilizer year to a record 4.3 million product tonnes. Production of urea, ammonium nitrate and ammonium phosphate were all higher than that in the previous year. Canadian exports of nitrogen fertilizers (mainly from western Canada) are estimated at 1.9 million nutrient tonnes or slightly below the levels of the previous year. Urea exports are projected to be 1.1 million product tonnes and ammonia to be 1.5 million product tonnes. Imports of nitrogen fertilizer (mainly to eastern Canada) are estimated to be 220 000 nutrient tonnes during 1988-89 or about the same as last year. Ammonium phosphate imports were down and urea imports were down. Nitrogen solutions and ammonium nitrate imports were higher than those last year. Preliminary reports indicate domestic consumption of 1.2 million nutrient tonnes of nitrogen in 1989, 1.0% above last year's level. Nitrogen inventories at basic producing plants at June 30, 1989, were a record 421 000 nutrient tonnes or double last year's closing inventory.

Figure 3

CONSUMPTION OF COMMERCIAL FERTILIZERS, CANADA,
BY REGION/FERTILIZER YEARS



* Estimate

Source: regional fertilizer associations

Phosphate

Canadian production of wet process phosphoric acid was approximately 500 000 tonnes P_2O_5, up 12% from the level of the previous year. Ammonium phosphate production was up 6% to 970 000 product tonnes. Imports of finished phosphates are forecast to be 220 000 nutrient tonnes. Preliminary shipment reports suggest domestic P_2O_5 consumption will be 614 000 tonnes, slightly below last year's level. Exports of phosphate fertilizer are down and estimated to be 121 000 product tonnes or 64 000 nutrient tonnes. An additional 10 000 tonnes P_2O_5 were exported as blended mixed fertilizer. Phosphate inventories at producing plants at June 30, 1989, were 98 000 nutrient tonnes or double last year's stocks.

Potash

Canadian potash production was a record 8.1 million nutrient tonnes during 1988-89 or 4% above the level of the previous year. Domestic consumption is estimated to be 357 000 nutrient tonnes or about 12% below last year. Imports of potash, mainly sulphate of potash and sulphate of potash magnesia, were 60 000 nutrient tonnes. Canadian exports of potash were 6.7 million nutrient tonnes, down 2% from last year. Some 3.4 Mt were exported to the United States. Potash inventories at Canadian mines were 1.82 million nutrient tonnes at June 30, 1989, which was 54% above last year's stocks.

Prices

Farm-level retail fertilizer prices in the early spring of 1989, when most sales occur, were 5.7% above year-earlier levels (Saskatchewan Farm Input Price Survey). Many retailers bought fertilizer in the fall and winter of 1988 at higher prices in expectation of tight supplies at planting time because they thought farmers were going to put heavy applications on their crops, but sales did not meet their expectations. As a result, large inventories were carried into the summer of 1989. With extra supplies and potential winter storage problems, prices softened.

Retailers are generally reluctant to buy in the fall of 1989 because of smaller retail margins and large inventories at the manufacturing level.

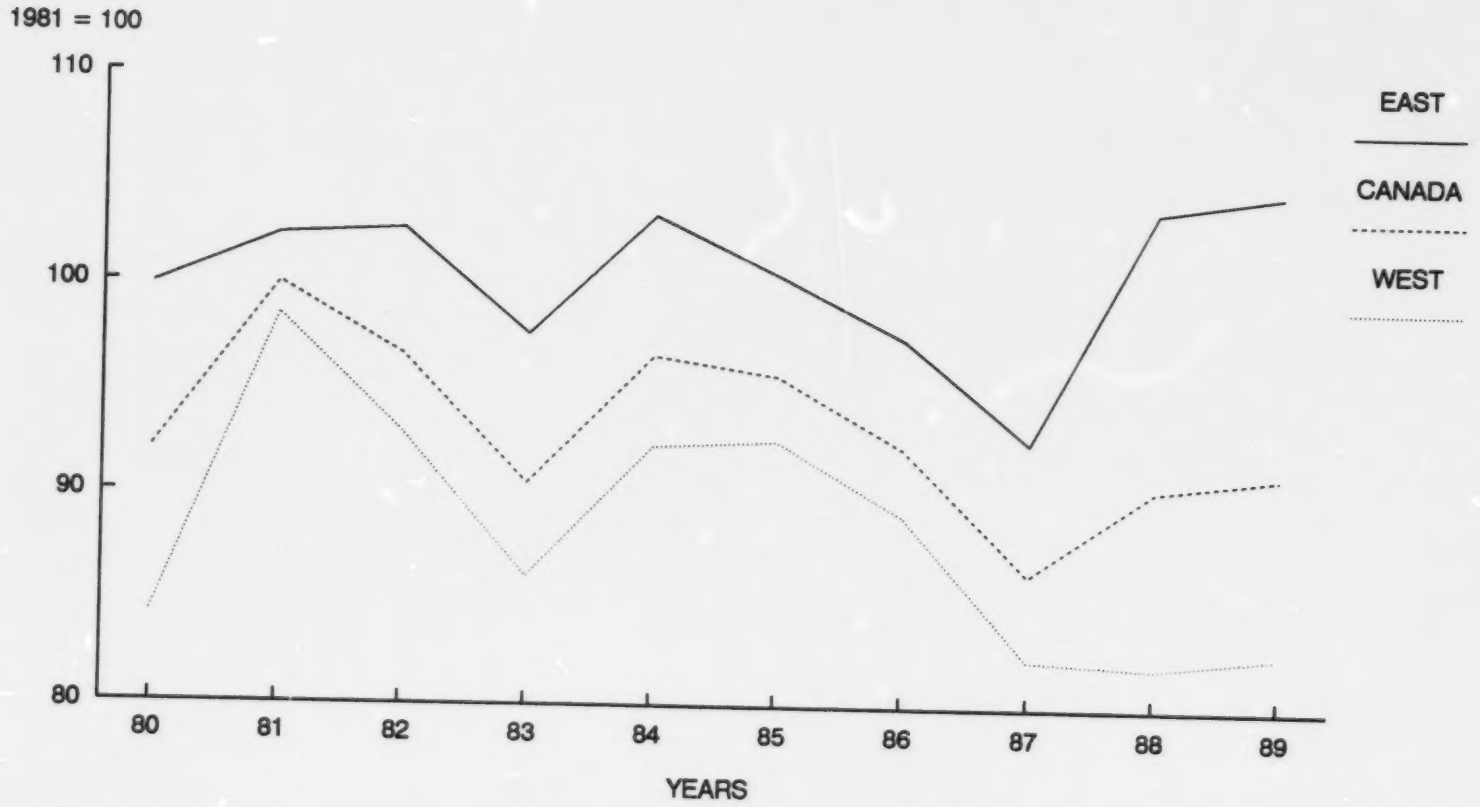
Financial performance of Canadian industry, 1988

The financial performance of the Canadian basic fertilizer industry showed a remarkable turnaround in the calendar year 1988. Price escalation in all three nutrients, combined with record sales volume in nitrogen and potash, contributed to this overall improvement in the financial performance. The industry went from a pretax loss of $31.7 million in 1987 to a pretax profit of $350 million in 1988.

Each nutrient segment showed improvement over the levels of the previous year, but potash producers had the most dramatic turnaround in 1988--from a pretax loss of $14 million in 1987 to a pretax profit of $292 million in 1988 (CFI Annual Report).

Figure 4

FERTILIZER PRICE INDEX*, CANADA, BY REGION



* Second quarter value

Source: Statistics Canada, 'Farm Input Price Index'

OUTLOOK

WORLD

World fertilizer consumption is expected to be 2.5 to 3% higher in 1989-90. This growth in projected consumption is due to projected higher planted area for 1990, as inventories of agricultural commodities have come down faster than expected. Global grain trade levels in 1989-90 are currently projected to be slightly higher than year-earlier levels. World inventories of fertilizer materials are high, especially of nitrogen (Figure 1). Global economic gross national product expansion will be more moderate in 1990 than in 1988 and 1989.

U.S. fertilizer demand growth is expected to increase 2 to 4% in 1989-90 U.S. production and consumption of fertilizer materials will be affected by weather conditions, fertilizer exports and imports, and government farm programs that affect grain acreage and kinds of crops planted. Current forecasts of modest growth in production and consumption in fertilizers are based on assumptions that weather conditions and crop commodity demands will be average through the spring of 1990.

The below-normal U.S. 1989 wheat harvest is expected to result in a further decline in ending stocks in 1989-90. Based on a 5% setaside program and flexible planting provisions in 1990, farmers could increase wheat acreage by 3 million acres in 1990 (USDA). Corn and soybean harvests in 1989 are normal.

The impact of increased U.S. winter wheat acreage in the fall of 1989 and a 3% increase in corn areas in 1990 will likely lead to increased U.S. fertilizer use in 1990. The increased 1989 acreage was not reflected in increased fertilizer use at that time because of high residual nutrients in the ground after the 1988 drought.

Prices

High inventories of fertilizer materials in the United States are continuing to pressure prices for fertilizers both marketed in the United States to U.S. farmers and exported from the U.S. However, current low world fertilizer prices will likely keep international fertilizer trade high, despite the inventories, helping to clear fertilizer stocks at the manufacturing plants (Chemical and Engineering News 1989).

World trading prices at the manufacturers' level are expected to recover in 1989-90. One key variable is the Chinese market, which has been importing 40% of world urea trade. Fertilizer consumption in China has grown rapidly during the past few years, making it the world's largest consumer of traded manufactured nitrogen fertilizer. The Chinese have been cautious in fertilizer purchases in the last half of calender year 1989 and are thus the largest single uncertainty in the world fertilizer market at this time. There is a shortage of foreign exchange in China. We cannot determine with much precision a whole variety of economic, political and climatic factors that can dramatically change the fertilizer trade sector next year, especially in China.

World prices have started to edge back up in the fall of 1989. For example after a $40/t decrease in phosphate prices in the summer of 1989, prices have recovered about $5-6/t in the United States.

CANADA

Supply-demand balance

While fertilizer consumption in Canada will not be as high as the record set in 1985, a marginal increase in fertilizer use of 2 to 4% is anticipated for 1989-90. These projections are dependent on present expectations of fairly good crop prospects for 1990, somewhat improved Prairie soil moisture reserves, reasonable farm income levels as a result of the average 1989 harvest, relatively favorable wheat prices for 1989-90, lower fertilizer residues in the soil in 1990 than in 1989 and fairly stable retail fertilizer prices in 1990.

Wet weather in some parts of the Prairies in the fall of 1989 has somewhat increased farmer optimism for 1990 crop prospects. Overall good soil moisture reserves make farmers inclined to use more fertilizer. However, despite the fall rains in 1989, soil moisture for wheat on continuously cropped land in some areas of the Prairies remained low. Weather and soil moisture conditions at planting time are crucial in determining fertilizer consumption.

Nitrogen carry-over levels in the soil across the Prairies next spring will not be as high as those in the spring of 1989 because better 1989 crops used up some of last year's ample supplies. Overall fertilizer consumption should be higher in the spring of 1990 than in 1989.

Net cash income in western Canada is expected to drop by 20% in 1989 from the record level of 1988, but by only 4% from the five-year average for 1984-88. Receipts for grains and oilseeds in 1989 will remain close to last year's levels, while increases are expected for other commodities such as potatoes, tobacco and special crops. Total crop receipts are expected to remain at about the same level in 1990 as in the last six years. Government program payments to producers are expected to decline by 4% in response to higher grain prices. Meanwhile operating expenses in 1990 are expected to be higher than the 1984-88 levels. Net cash flow is expected to be tighter in 1990.

Fertilizer use in 1990 will be constrained by generally weaker grain and oilseed prices expected in 1990. Wheat prices are expected to be fairly sustained and coarse grain prices are expected to decline more strongly. Wheat area will likely increase in 1990. Oilseed prices should also decrease as world oilseed production increases from 1988-89 record levels. Soybean prices are expected to take the biggest drop, while the forecast for flaxseed prices indicates a fall of 10 to 15%. Canola prices are expected to decline the least.

Prices

Canadian fertilizer prices may be 1% higher in the spring of 1990 relative to those in the year-earlier period. Normally, prices strengthen slightly in the spring application season. The balance of opinion leaning toward slightly stronger fertilizer prices assumes an improved moisture outlook in western Canada, increased Canadian grain exports and increasing world fertilizer prices. Abundant fertilizer supplies in late 1989 limit the potential for retail price increases from spring 1989 levels.

Canadian fertilizer prices, most particularly in eastern Canada, are influenced by world prices and not by the North American fertilizer market only. However, because of the geographic isolation of the western Canadian fertilizer industry and the higher transportation costs, retail prices are less volatile than world prices and follow a pattern similar to that in the northwestern United States.

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TABLE 1 CONSUMPTION OF FERTILIZER NUTRIENTS IN CANADA, 1980-81 TO 1988-89

	Nitrogen	Phosphate	Potash	Total
		(kt)		
1980-81	937.8	635.1	365.6	1 938.5
1981-82	965.9	636.3	343.6	1 945.8
1982-83	1 001.9	651.7	342.1	1 995.7
1983-84	1 157.5	712.7	370.3	2 240.5
1984-85	1 255.1	727.7	396.5	2 382.5
1985-86	1 219.8	695.2	369.8	2 286.0
1986-87	1 144.6	626.1	368.2	2 137.7
1987-88	1 185.5	634.5	405.6	2 225.6
1988-89[a]	1 156.7	613.6	357.0	2 127.3

[a] Preliminary data

Source: Regional fertilizer associations; Agriculture Canada.

TABLE 2 CANADIAN PRODUCTION OF SELECTED FERTILIZER PRODUCTS, FERTILIZER YEARS 1987-88 AND 1988-89

Fertilizer product	1987-88	1988-89	Change[a]
	(kt)		(%)
Ammonia	3 780.0	4 255.6	12.6
Ammonium nitrate	826.6	1 026.1	24.2
Ammonium phosphate	913.2	970.7	6.3
Urea	2 259.0	2 459.1	8.9
Muriate of potash	7 841.3	8 088.9	3.2

[a] Between 1988-89 and 1987-88

Source: Canadian Fertilizer Information System.

TABLE 3 SHIPMENTS AND INVENTORY OF COMMERCIAL FERTILIZER NUTRIENTS[a] OF CANADIAN MANUFACTURERS, FERTILIZER YEARS 1980-81 TO 1988-89

	Nitrogen	Phosphate	Potash	Total
		(kt)		
Shipments[b]				
1980-81	1 824	736	7 009	9 569
1981-82	1 806	676	5 590	8 072
1982-83	1 889	632	4 987	7 508
1983-84	2 283	671	6 865	9 819
1984-85	2 645	649	6 911	10 205
1985-86	2 647	586	6 640	9 873
1986-87	2 507	503	7 209	10 219
1987-88	2 297	472	7 406	10 175
1988-89	2 683	468	7 028	10 179
Ending inventory				
1980-81	118	126	1 072	1 316
1981-82	101	108	1 355	1 564
1982-83	165	57	1 494	1 716
1983-84	199	73	1 656	1 928
1984-85	114	69	1 861	2 044
1985-86	276	113	1 533	1 922
1986-87	311	77	1 143	1 531
1987-88	198	55	1 184	1 437
1988-89	421	98	1 824	2 343
Inventory as share of shipments		(%)		
1980-81	6.5	17.1	15.3	13.8
1981-82	5.6	16.0	24.2	19.4
1982-83	8.7	9.0	30.0	22.9
1983-84	8.7	10.9	24.1	19.6
1984-85	4.3	10.6	26.9	20.0
1985-86	10.4	19.3	23.1	19.5
1986-87	12.4	15.3	15.9	15.0
1987-88	8.6	11.7	16.0	13.3
1988-89	15.7	20.9	26.0	23.0

a These figures reflect the nutrient content of the fertilizer, which ranges from 20% to 80%, depending on the fertilizer type.

b Includes shipments to domestic and export markets.

Source: Canadian Fertilizer Information System.

AGRICULTURAL CHEMICALS

M. Spearin

HIGHLIGHTS

Worldwide usage of pesticides in 1990 will increase by 3%. Price increases will match global inflation. In Canada, the quantity of pesticides used may increase by 1 to 2%, with price levels 3% higher than those reported in 1989.

SITUATION

WORLD

In a few developed countries, the agricultural chemical market overall (pesticides including herbicides, insecticides, fungicides, etc.) is now approaching maturity and low rates of growth are anticipated. In the rest of the world, pesticide use is continuing to grow more rapidly.

The steady growth of agricultural production in the 1970s fueled high worldwide agrochemical growth, averaging 6.3% per annum in real terms. Growth was interrupted dramatically by decreased acreage because of the U.S. Payment-In-Kind (PIK) program in 1983. This led to a 2.9% real decline in world markets, the first-ever recorded real decline in the agricultural chemical market (World Crop Protection Prospects 1988).

Although growth returned in 1984, it settled at a lower average rate of 1.1% per annum for the four-year period 1984-87. Global sales in 1987 of about $20 billion represented a real decline of 1%. This second decline in agrochemical history followed only four years after the first (World Crop Protection Prospects 1988).

The largest country market is the United States, followed in order of importance by Japan, USSR, Brazil, West Germany, Italy, United Kingdom, Canada, China, India and Spain (Country NatWest WoodMac 1988-89).

United States

According to the USDA, estimated total U.S. 1989 farm pesticide use on the major field crops is projected at 462 million pounds, active ingredients (AI), up 5% from 1988. June 1 planted area for the 10 major field crops increased from 243 million acres in 1988 to 260 million acres. The area planted to corn, grain sorghum, soybeans, tobacco, and wheat rose, while area planted to cotton, barley, oats and rice declined.

Most of the increase in pesticide use can be attributed to the rise in corn acreage, which rose by 4.7 million acres from the year-earlier level. Corn accounts for 56% of herbicide use and 44% of insecticide use (USDA 1989b).

In 1988, most corn and soybean herbicides were applied before or at planting. Herbicides applied before planting are generally broadcast over the entire field, while at-planting applications for corn and soybeans are divided evenly between broadcast and banded applications. With a band application (10 to 13 inches wide) the active ingredient rate per acre is only one third of the broadcast rate, reducing herbicide treatment costs (USDA 1989b) and pesticide load on the environment.

Crop rotations, rather than continuous cropping, are often proposed to decrease pesticide usage and to alleviate environmental and economic concerns facing the agricultural sector. With some exceptions, most crop land is involved in some type of rotation. Five to ten various types of rotations accounted for more than 80% of the area planted to corn, soybeans, wheat and rice in 1988. Potato production rotations are more diverse (USDA 1989a).

United States prices

Greater pesticide demand raised average farm-level herbicide prices by 5.5% between 1988 and 1989, following a 3.7% increase a year earlier. Herbicide and insecticide prices have shown a general rise over the past three years. The increase in the area planted to crops that require intensive use of pesticide has heightened demand. Dealer costs (especially liability insurance) also have risen, putting additional upward pressure on retail prices (USDA 1989b).

Atrazine, a major corn herbicide, showed the greatest increase at 18.4%. Farm-level insecticide prices are projected to be up 2.9% in 1989, compared with an increase of 3.1% in 1988 (USDA 1989b).

CANADA

Supply and demand

Western Canada

Pesticide sales rose again in 1989 to reach levels close to the record set in 1985. This was in response to anticipated heavy weed infestation and expected value from spraying, good weather for pesticide application, good prospects for crop growth and relatively favorable crop prices at application time.

The 1988-89 pesticide maket (October 1988 through to September 1989) started off well. The fall 1988 sales of soil-incorporated and phenoxy broadleaf herbicides were large. Spring rainfall in 1989 and moderate temperatures provided generally good conditions for weed spraying. These growing conditions also favored the growth of a crop that competed well with weeds. The effect of good spray weather and natural weed control from a competitive crop was good weed control in 1989.

In 1989 farmers expected weed pressures to increase and were prepared to spray in order to avert risk to what appeared to be good crops that could be sold at good prices. In contrast, farmers in 1987 had cut back on herbicide use to save money in a year of low crop prices, while the hot, dry 1988 season resulted in poor weed control, especially for weeds that flourish in drought conditions. The combined effect of the situation in these two previous years on the 1989 crop was to increase weed pressure from broadleaf, perennial and some grassy weeds, especially Kochia, pigweed, green foxtail and thistle. The broadleaf herbicide market increased the most.

Use of herbicides for grassy weed control probably increased slightly in 1989, primarily because of pressure from green foxtail. However, the large reduction in canola area and increased wheat and barley area tended to reduce pesticide usage. Cereal crops are more competitive with weeds than canola and require less herbicide. As well, with the dry, early spring, farmers wanted to plant canola early, which limited the opportunity to apply preemergent grass herbicides. The large wild oat market was relatively flat, as many farmers considered these products relatively expensive. The financial effect of the drought of 1988 probably had a negative influence on farmers' decisions to purchase products to deal with wild oats.

The tendancy during the mid-1980s toward the increased use of postemergence herbicide materials stopped in 1989 because of dry weather in the late-application season. Farmers did not cut the rates of application per hectare in 1989 as they did in 1988. Many farmers who cut back on rates in 1988 found that because the weeds were under stress from the drought, herbicides could not be well absorbed and were not effective in controlling weeds. Farmers did not want to risk repeating this occurrence.

Eastern Canada

The value of herbicide sales rose about 6% in Ontario in 1989 because of price appreciation. The volume of pesticides sold was probably unchanged or up slightly. Compared with a normal season, which lasts two weeks, the 1989 application season was both longer and about two weeks later than usual. As well, many farmers in early 1989 received stabilization payments to compensate for the 1988 experience of low crop prices and drought and, further, many sold some crop at higher market prices. Farmers were in an improved financial position to purchase pesticides, choosing the best product for their weed problem. After the application season, crop prices decreased and drier summer weather commenced.

Sales volumes of pesticides in Quebec were relatively stable in 1989. Dry conditions tended to reduce the use of pesticides in spite of the increase in corn area. Part of the increase in corn area came from the decrease in cereal area.

Sales 1988

Retail sales of pesticides in Canada for the pesticide year from October 1987 to September 1988 grew over those of the previous year by $96 million or 13% to $841 million. Despite the drought, the 1988 Canadian pesticide year thus had sales close to the record 1985 year.

Of this growth, $88 million was due to an increase in herbicide usage, particularly in western Canada on oilseeds such as canola. The western herbicide market grew by over $75 million, or 17% more than in 1987, with the canola and oilseed segment as the strongest contributor. Canola area grew by about 37% in 1988 from year-earlier levels. Typically, 80% of the canola area is sprayed with the relatively more expensive grassy weed herbicides. Only 35 to 40% of the cereal area is sprayed for grassy weeds. Increased canola area in 1988 increased the area treated with trifluralin, a major wild oat herbicide.

According to the Crop Protection Institute of Canada survey, the market is divided approximately as follows: The herbicide share of the Canadian pesticide market grew from 71.5 to 73.5%, while insecticides and fungicides decreased slightly to 6.3 and 3.7%, respectively. The home and garden segment remained at 8.4%. The remaining 8.1% is made up of various other markets such as livestock, growth regulants, fumigants, seed treatment products, etc.

On a regional basis, the CPIC survey showed retail sales of $532 million in western Canada or 63.3% of the total and Ontario sales of $213.6 million or 25.4% of the total. The Quebec and Atlantic provinces sales were $95.2 million or 11.3% of national sales. All of the percentages relate to sales value.

Prices

Herbicide prices in western Canada, as reflected by the Saskatchewan Farm Input Survey, rose by about 3% in May 1989 from year-earlier levels. Herbicide prices in eastern Canada, as reflected in the Farm Input Price Index, recorded a 7% increase in the second quarter of 1989 relative to the level in the first quarter. Most herbicides are sold in the second quarter of the calendar year. Farmers did not react negatively to the higher prices in 1989 because they expected value for money spent on herbicides, largely because weed control problems had been carried over from 1988.

OUTLOOK

WORLD

World wheat area is forecast to increase in 1990 in response to relatively favorable prices, lower world ending stocks and changes in the farm policy in the United States. U.S. farmers could increase wheat acreage by about 3 million acres over 1989 levels. This could mean an additional 855 000 pounds of pesticide, mainly herbicides. U.S. coarse grain crop areas are expected to remain unchanged in 1990. The new farm bill in the United States, given some environmental concerns, may reduce agricultural inputs, perhaps including pesticide usage, in the longer term.

European Community setaside policies are unlikely to have much effect on production. Rapeseed plantings are expected to increase by 20 to 30%. The Argentinian area planted to corn is expected to rise. Lower grain reserves worldwide and projected increases in demand are expected to result in generally increased areas and therefore an increase in the purchase of farm inputs, including pesticides.

The forecast for the overall agricultural chemical market for 1990 indicates the real growth rate will be around 3%. This compares with an estimated real industry growth rate of around 2.5% per annum from 1980 to 1988. This forecast of increased growth is even more uncertain than usual, because much of the growth is projected to be in less developed countries where farmer, business and government reactions to changing opportunities appear much less certain. Strong growth is also expected in the centrally planned economies. The developing and centrally planned countries are forecast to achieve average annual growth rates of between 3.5 and 4%. In some developing countries in which the intensification of agriculture will continue to be driven by high population growth, 5% real growth rates per annum are expected. However, these rates may be affected by the availability of foreign currency, import controls and the local business culture. Of the world's largest pesticide country markets, India may experience the highest growth rate in pesticide use, followed by Brazil, Spain, China, USSR, Italy, Japan, Canada, West Germany, United Kingdom and the United States.

World pesticide prices will increase in 1990 in response to international factors such as high research, development and manufacturing costs, marketing expenditures and targeted profitability levels. Pesticide price increases will generally match global inflationary levels.

CANADA

Pesticide sales volume in the pesticide year ending September 30, 1990, will likely remain the same as those in 1989 or increase slightly. The factors contributing to stable or increased pesticide use are strong weed infestation, which may continue in 1990, wheat area, which may increase, and very good application weather in the fall of 1989.

Pesticide use will also depend to a large extent on how rainfall and application weather develops in the spring 1990 growing season. If Prairie farmers get enough moisture for the 1990 crop, pesticide use will increase over 1989 levels because of high infestation levels. Farmers know from the experience of the past few years that a severe weed problem exists and will try to minimize yield losses. Financially, farmers will feel constrained in their pesticide purchases by tight cash flow and lower expected returns.

A large increase in pesticide use is not expected as farmers continue to recover from the 1988 drought with little grain to sell and as crop prices move lower. Despite fall rains in western Canada, soil moisture for wheat on continuously cropped land in some areas of the Prairies remained low.

In eastern Canada, an expected increase in winter wheat and corn areas will offset reduced soybean area. The fall 1989 pesticide market was larger than 1988. Velvetleaf continues to spread in Ontario. The net affect is that pesticide use is expected to increase in 1990 by about of 1 to 2%.

Pesticide prices will likely increase by about 3% in 1990 on average. Prices across Canada are likely to continue to follow American trends to higher prices. After only slight price increases for the last three years, there is some pressure by industry to increase prices in 1990.

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TABLE 1 HERBICIDE USE IN WESTERN CANADA, 1980-88

	1980	1981	1982	1983	1984	1985	1986	1987	1988
					(Mkg)				
2,4-D	2.9	3.6	3.1	3.1	3.4	3.2	4.3	3.4	3.2
TCA	0.7	0.4	0.4	0.3	0.4	0.2	0.3	0.3	0.1
MCPA	1.9	2.0	1.8	2.1	1.5	1.7	1.9	1.8	1.4
Bromoxynil and dicamba	-	-	1.8	2.4	2.2	1.4	2.2	2.2	1.9
Other herbicides	0.9	1.8	1.7	1.7	1.6	1.3	1.5	1.1	2.0
Total	6.4	7.9	8.7	9.6	9.1	7.8	10.2	8.8	7.6
					(Mha)				
Area treated with wild oat herbicides	7.2	7.2	9.6	7.5	8.2	7.9	9.6	5.4	11.0
Area planted to six major crops[a]	19.4	20.8	21.2	21.5	22.2	22.6	23.0	22.3	21.8

[a] Wheat, barley, oats, rye, canola, and flaxseed

Source: Manitoba Department of Agriculture, Economic Analysis Branch; and Statistics Canada, Field Crop Reporting Series, cat. no. 22-002, September 1989.

TABLE 2 SURVEY OF RETAIL SALES OF PEST CONTROL PRODUCTS, OCTOBER THROUGH SEPTEMBER PESTICIDE YEAR, 1987 AND 1988

Products	Canada 1987	Canada 1988	Growth 1988 over 1987	Distribution of total pesticide sales
	($ million)		(%)	
Herbicides	530.0[r]	618.4	17	73.5
Insecticides[a]	53.0	52.7	0	6.3
Fungicides[a]	30.0	31.2	4	3.7
Rodenticides	4.5	4.0	-11	0.5
Soil fumigants/ nematocides	7.3	8.3	14	1.0
Growth regulants	6.0	6.3	5	0.7
Livestock pesticides	11.4	9.0	-21	1.1
Home and garden	71.0[r]	70.3	0	8.4
Other	33.2	41.0	23	4.9
Total[b]	745.0[r]	841.2	13	100.0

a Seed treatment sales included in "other"
b Totals may not add due to rounding
r Revision

Source: Crop Protection Institute of Canada.

FARM CREDIT AND FINANCE

J.P. Caldwell

HIGHLIGHTS

The farm financial situation is expected to improve in 1990, although there will continue to be financial problems in the Prairies. Demand for credit in 1990 is expected to increase from 1989, although credit outstanding in 1990 is still expected to decline.

FARM CREDIT SITUATION[1]

Total farm credit extended in 1988 is estimated at $7.8 billion, which is unchanged from the 1987 level (Table 1). Total farm credit outstanding on December 31, 1988, decreased by 1.8% from $22.4 billion a year earlier to $22.0 billion (Table 2). The average interest rate on farm credit extended increased from 12.29% in 1987 to 13.73% in 1988 (Table 4), while the average interest rate on farm debt outstanding increased from 10.96% in 1987 to 11.71% in 1988 (Table 5). Total interest charges increased by 4.7% from $2.4 billion to $2.6 billion in 1988 (Table 5).

Long-term credit extended declined by 7% in 1988 largely because of the $304 million decline in credit extended by the Farm Credit Corporation (FCC). Intermediate credit was unchanged at $2.2 billion, while short-term credit extended increased by 6.6% as a result of a large increase in credit extended by cooperatives. The fact that credit extended has been declining in recent years and was unchanged in 1988 is probably indicative of a turnaround in the downward trend.

Long-term credit outstanding was down by 2.5% in 1988 because of the $400 million decline in debt owed to the FCC. Intermediate credit outstanding was unchanged at $5.7 billion, while short-term credit outstanding declined by 2.0% as a result of a decline in the amount of credit owed to provincial lending agencies.

Canadian interest rates in 1989 increased from 1988 levels. The September 25, 1989, Conference Board of Canada forecast calls for an average prime rate of 13.26% in 1989, an increase of approximately 243 basis points from the average of 10.83% in 1988 (Table 3).

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1 Each year, Agriculture Canada surveys lenders in order to develop estimates of the amount of agricultural credit extended and outstanding.

Most agricultural lenders report an increase in demand for agricultural loans in 1989. This increase in demand was a result of increased investment. Farmers were more optimistic in early 1989 and were buying land, albeit with larger down payments than in recent years. In addition, some farmers were replacing machinery, the purchase of which had been delayed in recent years. The increased demand for credit was offset by more conservative lending criteria by lenders and financing proposals from borrowers who had higher equity. Therefore, credit extended is expected to increase in 1989 by an estimated 2%, compared with no change in 1988. This increased level of borrowing, combined with repayments on existing loans and write-offs by lenders, suggests that total farm debt outstanding will still decrease in 1989 by about 2%.

FARM FINANCIAL SITUATION

Current situation

In 1989 commercial lenders are reporting a decrease in the number of problem-farm accounts. Therefore, for the second year in a row, the estimated percentage of farm borrowers in arrears has declined. For Canada, the estimated percentage declined from 11.8% in 1988 to 9.5% in 1989; the figure for 1987 was 12.5% (Figure 1). While the proportion declined in all regions, it is important to note that the degree of improvement was least in Saskatchewan and that the number of accounts in arrears in the Prairie provinces represented 75% of the total (about 50% of all farms are in the Prairie provinces). The dollar amount of principal and interest in arrears to major lenders in 1989 ($0.8 billion) was about 30% less than the amount ($1.2 billion) in 1988. This change resulted from actions by farmers, lenders and governments to resolve the situation of loans most seriously in arrears; that is, the nonperforming loan situation is being dealt with fairly quickly.

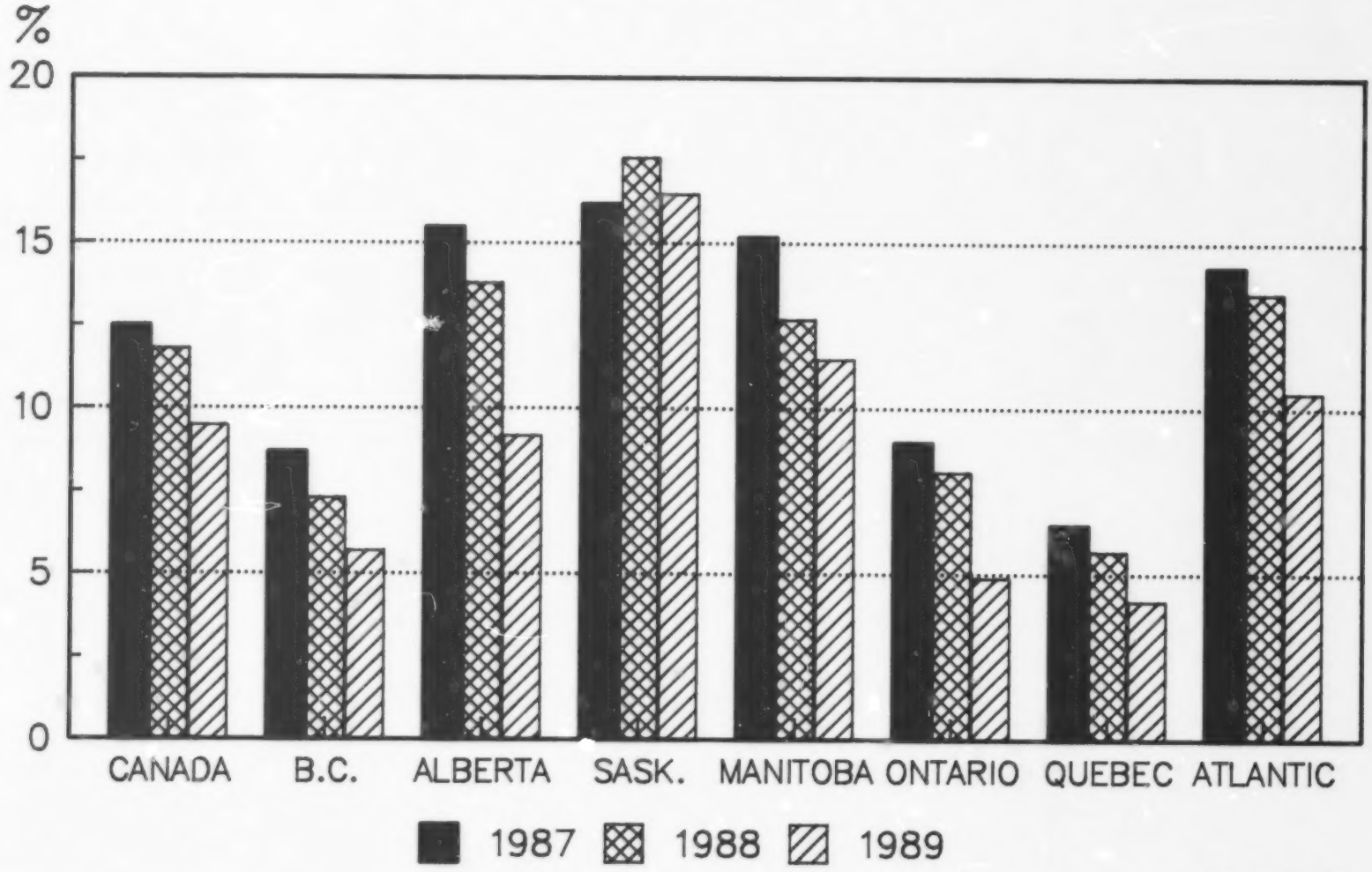
Additional information from lenders shows a downward trend in losses on farm loans and a near normal situation for some lenders on their agricultural portfolio in some regions. Total losses by chartered banks on farm loans were $144 million in 1986, $116 million in 1987 and $111 million in 1988, and are likely to decrease again in 1989.

The FCC reports that, as of October 1, 1989, some 11 648 of its accounts were in arrears. This amounts to 18% of all FCC borrowers, and represents a 12% decrease from the number in 1988. The following table shows the breakdown of the number of FCC loan arrears in terms of aging and indicates that the number of accounts in arrears has declined for all categories except for those less than one year in arrears. The increase in the less than one year category is due to the effects of the drought and provincial legislation in Saskatchewan. The dollar amount in arrears also declined in 1989.

FCC borrowers:

Aging category	October 1, 1988	October 1, 1989
less than 1 year in arrears	3 533	3 744
1-2 years in arrears	4 119	3 901
2-3 years in arrears	1 918	1 435
3+ years in arrears	3 721	2 568
Total in arrears	13 291	11 648

FIG.1: FARM BORROWERS IN ARREARS
1987–1989



SOURCE: AGRICULTURE CANADA, POLICY BRANCH

OL 1FIG.DRW

During the first eight months of 1989, there were 216 farm bankruptcies, which is 2.3% fewer than the number in the same period last year. This suggests that the annual decline in farm bankruptcies observed since the peak in 1984 will continue. At least in part, this trend reflects the fact that more farmers and/or creditors are taking corrective measures before the business deteriorates to the point where bankruptcy is the best or only alternative. Further evidence of this is shown by the decline in the number of applications to the Farm Debt Review Boards. There were 2 759 applications in the 12-month period ending September 30, 1989, which compares with 3 669 applications in the 12 months ending September 30, 1988.

FARM CREDIT OUTLOOK

A key factor determining farm credit extended is farm income. While net cash income reached a record high level in 1988, the outlook is for net cash income to decline in 1989. However, total net income (including changes in inventories) is expected to increase significantly, reflecting the anticipated buildup of Prairie grain stocks resulting from a return to normal production levels after last year's drought. Income prospects for 1990 are expected to see a further decline in net cash income while maintaining total net income at a level similar to that of this year.

Nominal and real interest rates in 1990 are expected to remain at the high level experienced during the past year. The prime rate is expected to average 12.56% in 1990. While the higher rates are clearly having a negative impact on the demand for loans for both long- and intermediate-term investments, there was increased activity in both the land and farm equipment markets in 1989. For the most part, equity is a much larger component of these transactions than was the case in the late 1970s and early 1980s. In line with the need to replace aging equipment and as a consequence of at least an average harvest, some increase in intermediate-term credit extended is anticipated over the next year.

On balance, the near-term outlook is for increased demand for farm credit overall, resulting in an increase in credit extended. However, the increase will not be sufficient to overcome the effects of repayment and prepayment on credit outstanding, and thus credit outstanding is therefore expected to decline. There will continue to be a reluctance by farmers to take on debt because of recent experiences. Hence, much new investment or replacement of capital assets is likely to be financed with large amounts of cash rather than debt. Consolidation of the farm's financial position will continue to be a greater priority for most farmers than farm expansion. Overall, debt outstanding in 1990 is expected to decrease by about 2% from the 1989 level.

OUTLOOK FOR FARM FINANCIAL CONDITIONS

In aggregate, financial conditions in the farm sector in 1990 are expected to show a continuation of the improvements observed in the industry in 1989. Despite the severe drought of 1988, major indicators continue to show gradual movement toward more normal conditions and/or stability. These improvements are in part a reflection of comparatively strong farm incomes for the past several years and the forecast improvement in total net income in 1989. At the same time, the overall incidence of financial difficulties has not returned to normal and is at unusually high levels in the Prairies, in particular Saskatchewan.

A major factor in the gradual financial recovery is the continuing efforts of farmers to reduce debt. The reduction of debt through debt repayment, reduced borrowings and significant write-offs by lenders of unsecured principal and interest reduces debt servicing costs and improves solvency. At the same time, farmland values in 1990 are expected to be above those of last year in all regions. These two factors will impact on the industry's debt/asset ratio, which is anticipated to decrease again in 1990 following slight decreases in 1988 and 1989. Very limited numbers of highly leveraged loans are being or will be approved in the current or foreseeable environment as both borrowers and lenders act to ensure that any particular arrangement is financially sustainable.

Since land is by far the most important component of the assets on the industry balance sheet, an end to the slide in the nominal value of land is economically significant, in terms of both collateral values and wealth. In some regions of the country, land values are now significantly above their lows, although well below their peak at the start of the decade. In this regard, there is quite legitimate concern about the need to maintain an appropriate relationship between market value and productive value.

TABLE 1 ESTIMATED FARM CREDIT EXTENDED, BY LENGTH OF TERM, 1970-88

	Short term	Intermediate term	Long term	Total[a]
		($ million)		
1970	1 674	308	200	2 182
1971	1 964	418	206	2 588
1972	2 092	605	232	2 930
1973	2 337	728	481	3 547
1974	2 680	800	717	4 197
1975	3 461	1 027	763	5 251
1976	3 289	1 501	852	5 643
1977	3 398	1 761	1 175	6 333
1978	3 774	2 013	1 627	7 413
1979	4 150	2 344	1 942	8 436
1980	4 623	2 446	1 986	9 055
1981	4 719	3 235	2 300	10 254
1982	4 615	3 128	2 233	9 975
1983	4 433	2 656	2 672	9 762
1984	4 439	2 404	2 125[r]	8 968[r]
1985	4 198	3 253	2 189[r]	9 640[r]
1986	3 796	2 284	2 286[r]	8 365[r]
1987	3 451	2 158	2 171[r]	7 780[r]
1988[b]	3 680	2 188	1 888	7 756

[a] Data may not total because of rounding; [b] Preliminary; [r] Revised

Source: Agriculture Canada, Policy Branch.

TABLE 2 ESTIMATED FARM CREDIT OUTSTANDING, BY LENGTH OF TERM, 1970-88

	Short term	Intermediate term	Long term	Total[a]
		($ million)		
1970	1 504	855	2 031	4 391
1971	1 637	917	2 063	4 617
1972	1 776	1 076	2 128	4 980
1973	1 846	1 503	2 391	5 740
1974	2 107	1 871	2 773	6 750
1975	2 540	2 241	3 181	7 962
1976	2 748	2 797	3 814	9 359
1977	2 759	3 436	4 436	10 630
1978	2 931	3 661	5 560	12 151
1979	3 193	4 409	7 042	14 644
1980	3 687	4 943	7 876	16 506
1981	4 066	5 400	8 951	18 417
1982	4 259	5 814	9 733	19 805
1983	4 370	5 505	10 955	20 831
1984	4 408	5 560	11 671	21 639
1985	3 986	6 466	12 315	23 147
1986	4 365	6 252	12 733	23 069
1987	3 757	5 727	12 927	22 411
1988[b]	3 681	5 733	12 604	22 018

[a] Data may not total because of rounding; [b] Preliminary

Source: Agriculture Canada, Policy Branch.

TABLE 3 SELECTED ANNUAL AVERAGE INTEREST RATES AND BOND YIELDS, 1970-89

	Bank of Canada rate	Bank prime lending rate		Government of Canada 5 to 10 year bonds	Real interest rate[a]
		Canada	U.S.		
			(%)		
1970	7.13	8.17	7.81	7.58	4.87
1971	5.27	6.48	5.69	6.15	3.58
1972	4.75	6.00	5.29	6.75	1.20
1973	6.13	7.65	8.17	7.17	-0.05
1974	8.50	10.75	10.73	8.27	-0.15
1975	8.50	9.41	7.73	8.01	-1.99
1976	9.25	10.08	6.81	8.72	2.58
1977	7.71	8.06	6.88	8.14	0.16
1978	8.98	9.69	9.19	9.08	0.89
1979	12.10	12.91	12.72	10.16	3.71
1980	12.89	14.26	15.32	12.30	4.06
1981	17.93	19.29	18.66	15.29	6.79
1982	13.96	15.81	14.58	14.03	5.07
1983	9.55	11.17	10.79	11.11	5.37
1984	11.31	12.06	12.00	12.42	7.71
1985	9.65	10.58	9.88	10.78	6.63
1986	9.21	10.52	8.25	9.37	6.43
1987	8.40	9.52	8.21	9.55	5.12
1988	9.69	10.83	9.40	9.76	6.78
1989[c]	12.16	13.26	10.75	b	8.06

a Canadian prime lending rate minus the rate of inflation
b Not available
c Forecast

Source: Bank of Canada Review, 1970-89; Conference Board of Canada, September 1989.

TABLE 4 ESTIMATED FARM CREDIT EXTENDED AND INTEREST RATES, 1987 AND 1988

Source and term of credit	Estimated farm credit extended		Estimated average interest rate	
	1987	1988	1987	1988
	($ million)		(%)	
Long term (10 years and over):				
Farm Credit Corporation	440.5[r]	136.2	10.6	12.0
Provincial government agencies	99.4	119.3	9.37	9.40
Private individuals	319.8	310.2	10.58	11.5
Insurance trust and loan companies	1.5	10.0	10.70	11.25
Credit unions	355.0	372.8	11.75	12.25
Banks	849.3	823.8	11.33	11.83
Other[a]	105.0	115.5	12.06	12.56
Total, long term	2 170.5[r]	1 887.8	11.07[r]	11.76
Intermediate term (18 months to 10 years):				
Banks (FILA)	115.7	103.7	10.52	11.83
Banks (other than FILA)	642.5	674.6	11.02	12.33
Private individuals	163.5	158.6	10.0	11.0
Supply companies	544.6	626.3	11.75	12.25
FCC (farm syndicate loans)	1.4	0.7	10.9	12.2
Insurance, trust and loan companies	11.0	20.0	10.5	11.0
Federal Business Development Bank	10.7	8.1	12.5	13.6
Provincial government agencies	99.6	2.0	9.0	8.65
Credit unions, including FILA	460.0	483.0	10.77	12.08
Municipal (Ontario Tile Drainage)	14.5	11.8	8.0	8.0
Other[a]	94.7	99.4	14.08	15.08
Total, intermediate term	2 158.2	2 188.2	11.07	12.22
Short term (up to 18 months):				
Banks (other than FILA)	1 605.7	1 525.4	10.52	11.83
Supply companies	224.5	235.7	20.35	20.48
Credit unions	430.0	451.7	10.52	11.83
Private individuals	12.3	11.9	10.0	10.5
Provincial government agencies	58.1	18.3	8.5	5.2
Cooperatives	825.4	1 135.0	21.29	22.16
Other[a]	295.0	302.4	12.0	13.0
Total, short term	3 451.0	3 680.2	13.83	15.63
Total, all credit	7 779.7[r]	7 756.2	12.29[r]	13.73

a Includes Alberta Treasury Branches
r Revised

Source: Agriculture Canada, Policy Branch.

TABLE 5 ESTIMATED FARM CREDIT OUTSTANDING, INTEREST RATES AND INTEREST CHARGES, 1987 AND 1988

Source and term of credit	Estimated farm credit outstanding		Estimated average interest rate		Estimated total interest charges	
	1987	1988	1987	1988	1987	1988
	($ million)		(%)		($ million)	
Long term (10 years and over):						
Farm Credit Corporation	4 482.1	4 082.5	10.8	10.70	488.4	458.2
Provincial government agencies	1 658.7	1 637.9	8.78	8.82	148.6	145.3
Private individuals	1 255.7	1 217.8	10.75	10.90	136.1	134.8
Insurance trust and loan companies	25.0	33.8	11.50	11.75	2.9	3.5
Credit unions	1 087.2	1 141.1	12.05	12.65	130.9	140.9
Banks	3 977.7	3 957.7	12.65	13.25	481.6	525.7
Other[a]	440.9	533.1	10.47	11.14	45.2	54.3
Total, long term	12 927.3	12 603.9	11.20	11.47	1 433.7	1 462.7
Intermediate term (18 months to 10 years):						
Banks (FILA)	316.5	351.3	10.52	11.83	37.2	39.5
Banks (other than FILA)	1 959.5	1 949.7	11.02	12.33	230.4	241.0
Private individuals	465.4	451.4	10.50	11.0	47.2	50.4
Supply companies	713.4	826.2	11.60	13.36	81.2	102.8
FCC (farm syndicate loans)	5.7	4.6	11.60	11.60	0.7	0.6
Insurance, trust and loan companies	70.0	95.0	11.50	12.0	8.0	9.9
Federal Business Development Bank	34.4	36.0	12.8	13.2	4.4	4.6
Provincial government agencies	909.6	710.6	6.12	8.08	62.2	65.5
Credit unions, including FILA	899.2	943.8	10.77	12.08	98.9	111.3
Municipal (Ontario Tile Drainage)	123.0	120.0	8.0	8.0	10.3	9.7
Other[a]	230.1	244.2	13.76	14.65	30.3	34.7
Total, intermediate term	5 726.8	5 732.8	10.27	11.78	610.8	670.0
Short term (up to 18 months):						
Banks (other than FILA)	2 436.8	2 424.6	10.52	11.83	273.9	287.6
Supply companies	204.2	228.9	15.77	16.94	15.9	18.3
Credit unions	413.0	433.4	10.52	11.83	44.4	50.1
Private individuals	83.3	80.8	10.0	10.50	8.4	8.6
Provincial government agencies	238.6	145.4	10.02	10.12	23.0	19.4
Cooperatives	135.1	109.9	19.94	20.37	10.3	12.5
Other[a]	245.7	258.5	11.96	13.42	28.6	33.8
Total, short term	3 756.7	3 681.5	11.19	12.42	404.5	430.3
Total, all credit	22 410.8	22 018.2	10.96	11.71	2 449.0	2 563.0

a Includes Alberta Treasury Branches
r Revised

Source: Agriculture Canada, Policy Branch.

REVIEW OF THE FINANCIAL SITUATION OF CANADIAN FARMERS

Roger K. Eyvindson and J.P. Caldwell

HIGHLIGHTS

The seventies and eighties have led to significant changes in agricultural finance. The lessons which we learn from these changes will determine to some extent if the financial problems in the agricultural industry are repeated in the next decade.

THE 1970s AND 1980s

The period since 1970 has been one of extreme volatility in the financial position of agriculture. The high nominal and real incomes of the 1970s led to a bidding up of land prices and increases in the value of agricultural assets that far exceeded the current income earned from farming. Between 1971 and 1981, for example, realized net farm income in Canada averaged $2.9 billion, while the value of farm assets increased by an average of $10.7 billion annually. In other words, while the income earned from agricultural production during this period was at record levels, the increase in asset values was more than three times as large. By way of comparison, average net farm income between 1968 and 1971 averaged $1.2 billion and the value of assets increased by an average of $0.4 billion annually.

The relatively high income levels, the dramatic increases in asset values, very low and even negative real interest rates and the expectation that these trends would continue encouraged many farmers to take on heavy debt loads in order to establish or expand their farm businesses. Given the high and increasing levels of farm asset values, both private and public agricultural lenders were more than willing to meet farmers' demands for additional credit.

After the boom years of the 1970s, agriculture faced financial difficulties that were unprecedented since the 1930s. Market returns, in particular those for grains and oilseeds, declined precipitously; real interest rates moved from historic lows to historic highs; and the value of farm assets in response declined by 21% between 1982 and 1988 to a level of $103 billion. Those who were highly leveraged found themselves with neither the cash flow nor the security needed to service their debt.

For most farmers, the 1980s were a period of severe difficulty but not of disaster. The high equity-to-asset ratios (80-85%) that are traditional for farm businesses insulated most farmers from the high real interest rates and left them with more than adequate security for their loans, despite declining asset values. The support provided by governments, in particular the federal government, ensured that the collapse of farm income that occurred in the 1930s would not be repeated. Even with the very high-risk loans extended in the 1970s, 82% of the clients of the FCC were current with their loans at the end of the third quarter of 1989. Furthermore, while the decline in farm numbers continued in the early 1980s, it was not significantly more rapid than in the much more favorable period of the 1970s. Between 1971 and 1981, the number of farms declined by

an average of 1.4% annually; between 1981 and 1986, the annual rate of decline was 1.6%. Moreover, the number of farms with sales in excess of $50 000 (1985 dollars) continued to increase between 1981 and 1986 at a pace only slightly below that for the 1971-81 period (2.5% compared with 2.7%).

THE CURRENT SITUATION

Despite the financial difficulties of the 1980s, the average farm family was able to maintain a favorable balance sheet. During the 1980s, the FCC conducted three Farm Surveys and obtained full balance sheet information for December 31, 1980, 1983 and 1987. The average equity level (measured as the value of equity divided by the value of all assets) declined only slowly over this period, even though the total debt level peaked and asset values began to fall. In 1980 the average equity level equaled 85%. By 1983, it had declined to 82% and by 1987 to 80%.

Figure 1 presents data on the income of farm families drawn from the 1988 Farm Survey conducted by the FCC. The income figures shown on this chart are net farm income before depreciation plus off-farm income. This measure of income represents the funds received by the farm family during the year that are available for family living expenses, the purchase of replacement machinery and equipment, principal repayment, and savings.

As shown on Figure 1, very small farm operations (sales under $25 000) generate almost no net farm income. Essentially all of the $23 000 in income received by the average family in this group is from off-farm sources. For those in the middle group, who still operate fairly small farms, about one half of the average income of $24 000 comes from the farm business and one half from off-farm sources. Those operating substantial farm businesses (sales over $50 000) have average incomes of nearly $52 000, of which $42 000 is from the farm.

Canadian farm families have incomes that on average are comparable with those of other Canadian families. Data from the Consumer Finance Survey conducted by Statistics Canada show that in the late 1960s and early 1970s the income of farm families was about 75% of the income of all Canadian families, but since 1973 the two have been roughly equal (Figure 2). In this case, the income of farm families is measured as net farm income after depreciation is subtracted but includes income from off-farm sources. It is the income available for family living expenses and savings and is therefore comparable with the income measured for other Canadian families. It should also be noted that a farm family in this instance is defined as a family that has at least one member for whom net farm income is the major source of income (that is, net farm income is larger than any other single source of income). Many families with very small farm incomes will be excluded from this definition. In absolute terms, the income of farm families averaged $37 000 in 1987 while that of all families averaged $36 000.

The long-run return to farm assets may be a better indicator than the level of family income as to whether farm families will be encouraged to stay in farming, rather than to move to another occupation. It is difficult to determine the current returns to the investment in farm assets because of the need to allocate the total returns to farm business between family labor and capital. The different procedures that have been used in this allocation have resulted in wide variations in the estimated current returns to farm capital. However, most estimates for the 1970s and 1980s suggest a current return to capital of about 3 to 5%. In other words, after providing for a return for

FIG. 1 AVERAGE NET FARM INCOME, OFF-FARM INCOME

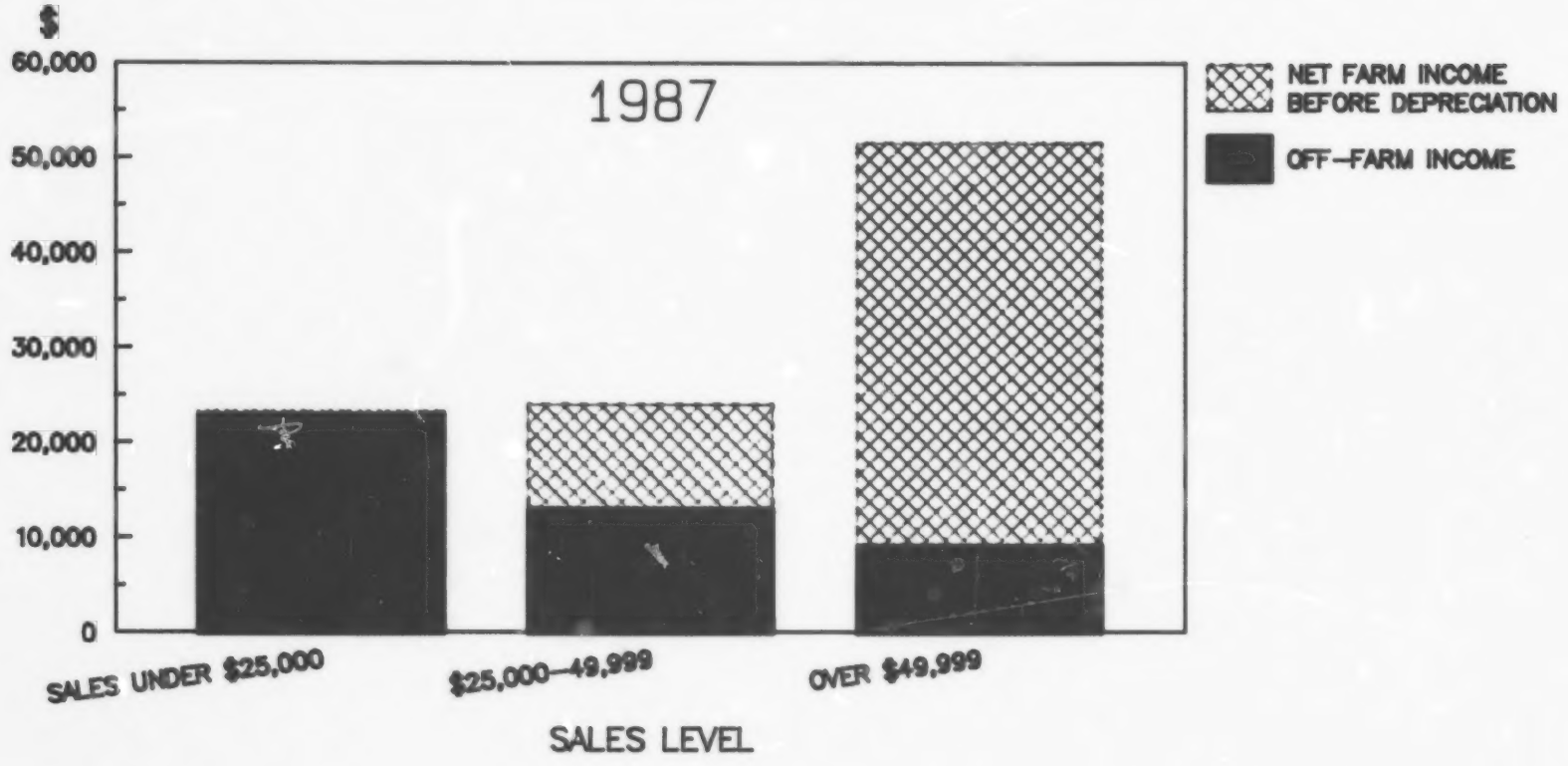


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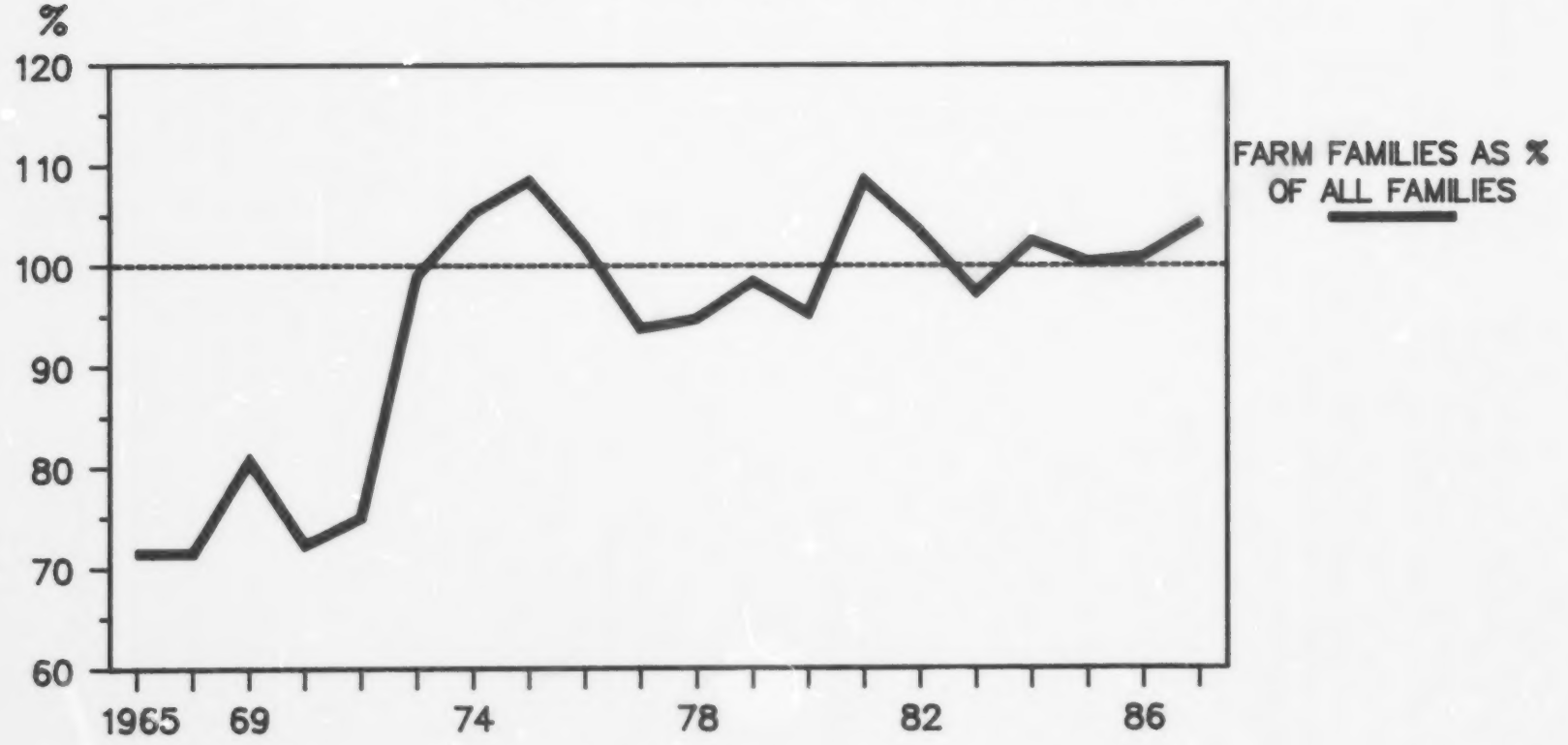
FIG.2 FAMILY INCOME
CANADA, 1965–1987



SOURCE: STATISTICS CANADA, CONSUMER FINANCE SURVEY

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operator and family labor, the net income from farming operations was equivalent to a return of about 3 to 5% on the current market value of farm assets. In comparison, the dividends paid on the Toronto Stock Exchange's Index of 300 stocks (TSE 300) yielded an average of 3.78% in the 1970 to 1988 period.

In addition to the current returns earned by farm businesses, farmers have generally also seen the value of their farm assets increase over time, although this has not, of course, been true in recent years. In the 1970s, the increase in the value of farm capital, principally farmland, was very rapid, with gains of more than 20% being registered in a number of years. It is estimated that between 1971 and 1987, the value of farm capital increased by an average of 9.3% annually. Again, by way of comparison, the increase in the value of the TSE 300 stocks averaged 7.5% annually during the same period. While farmland has fallen in value since 1981, the average value per acre in 1987 was 35% above the 1971 level after adjusting for inflation.

Although on average farmers have maintained income levels comparable with those of other Canadians and strong balance sheets, it is important to note two points. First, this would not have been possible if farmers had relied on income from market sources alone; without the government assistance provided to farmers in the 1980s, incomes and equity levels would have been much lower (see Figure 3). Second, there remain farmers who are at serious risk of financial failure and others who, while not at immediate risk of failure, earn very little income.

FARMERS IN FINANCIAL DIFFICULTY

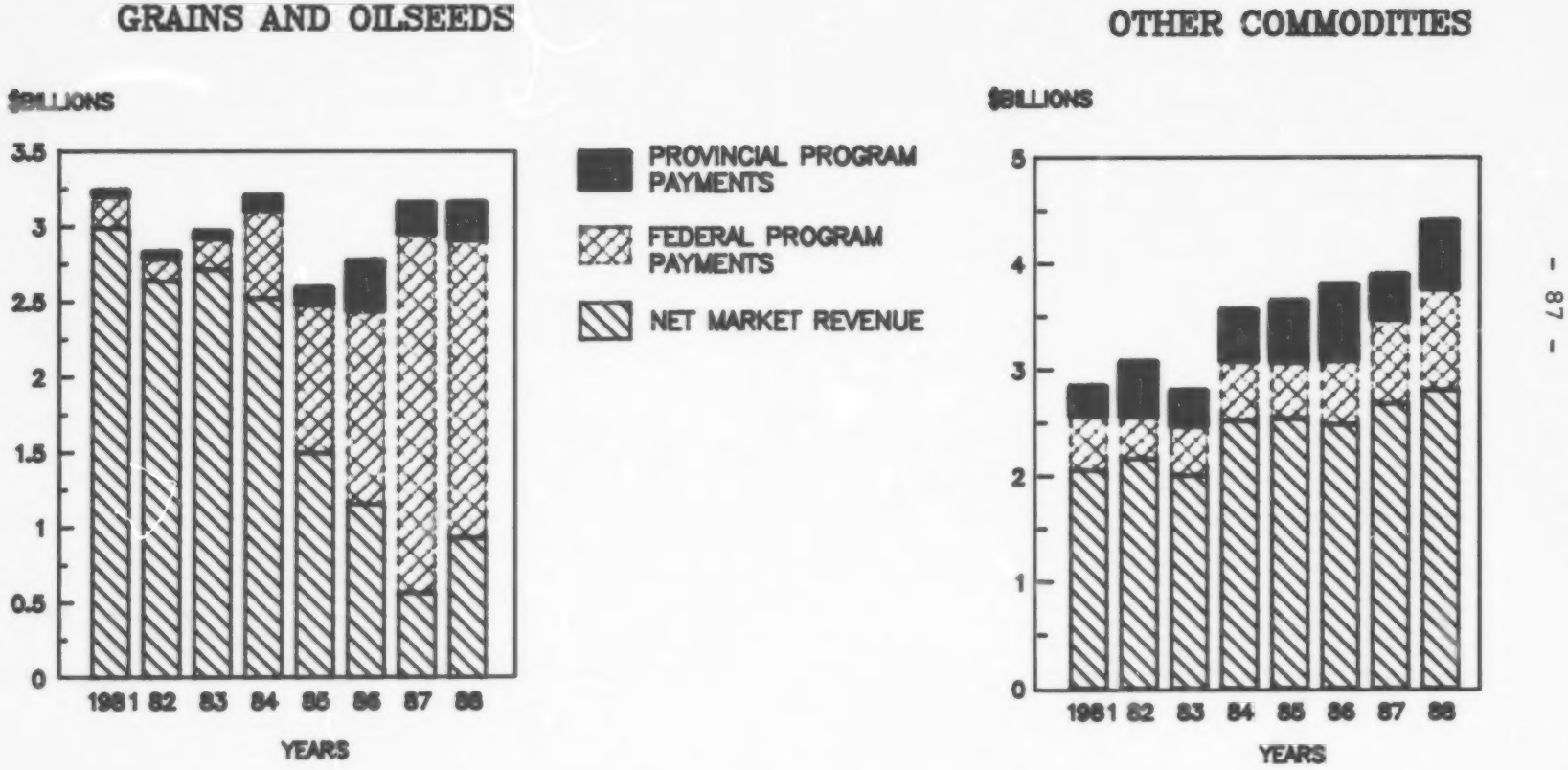
The data collected in the 1988 Farm Survey were used to classify farm families by equity level (equity as a percentage of assets) and cash flow (net farm income before depreciation plus off-farm income minus principal payments). The results are summarized in Figure 4.

All of the 26% of farmers who have cash flows less than $10 000 must be considered to have serious income problems, but otherwise their situations are quite different.

The 5% of all farms who have less than 50% equity in their farm businesses and cash flows under $10 000 are at very high risk of financial failure. These farms have medium to large farm businesses (sales and government payments averaging $105 000 in 1987) but, even before subtracting interest payments, the net farm income averaged only $16 250. Even including off-farm income, the family would be left with only $2 000 after interest payments. This means that interest or other farm expenses would have to be left unpaid in order to meet family living expenses. Unless there is a major injection of capital into these businesses, the already high debt level is likely to increase further as interest costs are allowed to go into arrears, and the business will eventually fail.

The 6% of farmers who have cash flows under $10 000 and equity between 50% and 75% are in a vulnerable financial position. Again these farmers have medium to large businesses (sales plus government payments averaged just over $120 000 in 1987) but low farm incomes ($14 500 before interest payments are taken into account). After interest payments and including off-farm income, the family would have only $1 200 for living expenses. Still, these families have a reasonably strong balance sheet (equity in the business of $340 000) and, with an increase in farm output or price levels, many of these families will be able to remain in business.

FIG. 3 NET REVENUE BY SOURCE
CANADA, 1981–1988



SOURCE: STATISTICS CANADA

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FIG. 4 FINANCIAL VIABILITY

CASH FLOW	EQUITY		
	UNDER 50%	50-75%	OVER 75%
		(PERCENT)	
UNDER $10,000	5	6	15
$10,000 - $20,000	3	3	13
OVER $20,000	5	10	40

SOURCE: 1988 FARM FINANCE SURVEY

OLFIN4.DRW

The 15% of farmers who have cash flows under $10 000 and equity over 75% have, on average, quite small farm businesses ($44 0000 in sales and payments), and they have little off-farm income as well. These farmers tend to be older than the other farmers with cash flows below $10 000 (average age of 56 years compared with 43 years for those having equity between 50% and 75% and 38 years for those having less than 25% equity), and some will be in the transition between active farming and retirement. While these families have very low incomes (an average of only $2 200 is available for family living expenses after interest payments), they do have substantial assets and few debts-the equity level averaged 91% and the absolute equity averaged $335 000. Increases in commodity prices or in government commodity payments will do little to increase the income levels of this group, however, because their farm businesses are so small.

It might be noted that the group with $10 000 to $20 000 in income and equity of over 75% share many characteristics with the group discussed in the last paragraph. This group has more income available for family living expenses ($17 000 compared with $2 200), but they also have very small businesses (average sales and government payments of $42 000) and tend to be operated by older farmers (average age of 55 years). They also have high equity levels (average of 93%) and relatively large net worths ($295 000 on average).

In total, those farmers having cash flows under $20 000 and equity over 75% made up more than one quarter of the total population of farmers in 1987, although they accounte ! for only 12% of the total sales of agricultural products. While they have income problems, this group does not have debt problems. The income problems of these families will not be solved through agricultural policies directed at increasing commodity returns, given the small size of their farm businesses. Many are approaching retirement age, and on average they appear to have a sufficient asset base for a reasonable retirement income.

OPERATING COSTS, MANAGEMENT SKILLS AND FINANCIAL POSITION

One characteristic that is shared by the three groups having cash flows below $10 000 is high average operating costs. Before accounting for interest payments or depreciation, the operating costs for these groups ranged from $0.85 to $0.97 per dollar of revenue (sales and payments). This compares with an average of about $0.65 for the groups having incomes over $20 000 (see Figure 5).

While it has long been recognized that costs vary among farms, the extent of that variation, the causes behind it and its importance to the financial success of farm businesses are just beginning to be fully realized. This phenomenon is illustrated by data obtained for small and large dairy farms in Quebec and large grain and oilseed farms in Saskatchewan and Ontario (see Tables 1 to 4). The enterprises operated by the farmers within each of these groups are very similar in size, but the operating costs, relative to gross receipts, vary so widely that they make the difference between a very adequate family income and one that is near or below the poverty line.

The basic question is: What lies behind these very large cost differences? One possibility is that random events (drought, fire, disease) cause wide swings in output or cost levels; that is, a farmer with high costs relative to revenue one year may have low costs the next year. As yet, no definitive conclusion can be made about this point, but the available evidence suggests the contrary; that is, those with high costs in one year tend to have high costs every year.

FIG. 5 OPERATING COSTS (EXCLUDING INTEREST) PER DOLLAR OF REVENUE BY CASH FLOW AND EQUITY

CASH FLOW	EQUITY		
	UNDER 50%	50–75%	OVER 75%
	(Cents)		
UNDER $10,000	84.6	88.0	96.9
$10,000 – $20,000	66.5	70.9	75.1
OVER $20,000	66.3	64.7	63.8

SOURCE: 1988 FARM FINANCIAL SURVEY

AOPCOST.DRW

Those who have studied the cost variations on Quebec dairy farms indicate that more efficient farms have:

- lower feed purchases per cow,
- fewer acres per cow,
- lower machinery and crop expense per acre,
- more cows per person working on the farm,
- better crop yields per acre.
- lower replacement rates for cows,
- higher milk production per cow, and
- more efficient milking technology.

In short, farmers who have lower costs are doing a better job of managing the production side of their farm businesses. It can be noted that the cause and effect among the biological relationships underlying a modern farming enterprise are often quite complex. Thus, the determination of the lowest-cost method of operation for each farming situation is not a simple matter. Therefore, it is not surprising that some producers are much more successful in this regard than others.

The experience of the Farm Debt Review Boards and of agricultural lenders supports the conclusion that weaknesses in production and financial management skills are major contributing factors to the financial difficulties farmers face. Even some of those who excel at producing high-yielding crops and livestock have little interest in or understanding of the cost and financial side of the business, and as a result they may have low incomes, despite their high yields.

IMPLICATIONS FOR THE FUTURE

The 1980s brought many problems for farmers, but important lessons can be learned from these years to help the industry move beyond the problems of the past and to prepare for the future. The boom/bust cycle of the late 1970s to early 1980s saw many Canadian farmers with high debt levels, in part caused by the inflated prices they had paid for land in the late stages of the boom years. When commodity prices declined, land values also fell, resulting in low equity values relative to equity in previous years. This could happen again in the future or other kinds of problems could face the industry. The basic issue to be addressed is whether there are steps farmers can take to better prepare themselves to respond to the problems in the years ahead. While there is no definitive answer to this question, there are some indications of the areas that should be explored.

Farmers will need to arrange their businesses in ways that enable them to respond to changing circumstances, since future market prospects for agricultural products are, if anything, even more uncertain than those in the past. This may well mean that farmers will have to continue to maintain a large degree of equity in the farm business in order to absorb unanticipated market changes. It also might mean diversifying the farm operation, possibly by expanding outside the farmgate. It might mean arranging more flexible financing so that one or two difficult years will not result in the failure of the farm business. Or it might mean entering into a financing arrangement that shares the risk with outside investors.

While the total returns to the capital invested in agriculture appear to have been comparable with those in other sectors, the relatively low current return limits the debt-servicing capacity of farm businesses, especially in the early years after establishment. To overcome the risk of inadequate cash flow in difficult years, most farmers will have to maintain, as they have in the past, high levels of equity.

Farmers will also need financial information on their operations and the the ability to use it. The only financial statements some farmers see are the cash basis statements prepared for them for tax purposes by bookkeeping or accounting firms. The experience of the Farm Debt Review Boards is that many of the farmers coming to them had so little knowledge of the financial side of their businesses that they did not know they were in any difficulty until their loans were called. There is a consensus among agricultural lenders and farm management specialists that cash basis accounting has often led farmers into unprofitable business decisions that could have been avoided if the information provided by accounts prepared on an accrual basis had been available.

However, good accounting in itself is not sufficient. Unless a farmer is fully able to understand the accounts and has sufficient interest to keep abreast of the financial position of the business, the best set of books in the world will not lead to better management decisions.

The possibilities for improving farm incomes and credit worthiness by increasing operating efficiency through better management skills appear to be great if we use the performance of the most profitable farms as the standard to strive for; this standard is, of course, gradually changing over time as new technology helps farmers to reduce costs and to increase product value and enables new products to be marketed. To develop effective farm management training and advisory initiatives, a significant effort is required to clearly identify the differences in practices that give rise to such large variation in economic performance. Examples of the issues facing farmers include:

- Which techniques are most effective in motivating farmers to increase their management and production skills and teaching those skills?

- Which are the most profitable farming techniques in use by our most efficient farmers, and how do these differ from practices that, while often in use, are much less profitable?

Options that might be explored include:

- Collecting and making available to farmers the farm level financial information they need in order to better determine which management and production skills are most effective and to enable them to judge their own performance;

- Encouraging farm input suppliers to provide support and assistance to farmers in reducing costs, perhaps taking advantage of joint government-industry projects to identify the possibilities for cost reduction and improved input use;

- Developing standard financial accounting principles for agriculture; and

- Encouraging both private and public sector lenders to require complete financial records on an accrual basis and encouraging those lenders to help farmers in setting up and interpreting these records, while permitting farmers continued flexibility in the tax system.

SUMMARY

In terms of farmers' financial situation, the 1970s and 1980s have been one of the most volatile periods ever experienced by Canadian farmers. After the boom of the 1970s, the bust of the 1980s left many highly leveraged farmers in a precarious financial position. For the first time since the 1930s, there were significant numbers of farm business failures.

With the aid of increased levels of government assistance, most farm families were able to weather this difficult period. However, the immediate financial prospects are not encouraging and there are many uncertainties about what the 1990s will bring.

To meet the challenges of the years ahead and to take advantage of the opportunities that arise, farmers will need to evaluate the financial arrangements they enter into very carefully in order to ensure that their financial obligations can be met in difficult as well as in favorable periods.

With the changes likely to be introduced by through biotechnology in the years ahead, the management of farm businesses will be even more complex than in the past. Those who are able to expand their management skills will be best able to meet the challenges of the coming decade.

TABLE 1 PROFILE OF SMALL DAIRY FARMS ($47 183 TO $84 999) FROM NORTH EAST QUEBEC WITH MEDIUM EQUITY LEVEL AND 30 COWS, 1986

	Operating margin		
	Low	Medium	High
		(number)	
Farms	245	290	265
		(dollars)	
Sales	63 114	65 601	64 663
Market receipts	57 289	60 110	59 644
Industrial milk subsidy (est.)	5 825	5 491	5 019
Expenses	57 816	48 085	38 258
Livestock expenses	17 880	14 901	12 996
Crop expenses	4 400	3 833	3 268
Depreciation (est.)	6 750	6 750	6 750
Net farm income	(1 452)	10 766	19 655
Off-farm income	12 639	11 206	17 771
Total family income	11 187	21 972	37 426

Source: Census of Agriculture and Census of Population, 1986.

TABLE 2 PROFILE OF LARGE DAIRY FARMS ($132 872 to $243 628) FROM SOUTH WEST QUEBEC WITH MEDIUM EQUITY LEVEL AND 55 COWS

	Operating margin		
	Low	Medium	High
		(number)	
Farms	95	140	100
		(dollars)	
Sales	164 364	171 634	172 753
Market receipts	153 995	160 548	163 201
Industrial milk subsidy (est.)	10 369	11 086	9 552
Expenses	148 935	126 496	100 525
Livestock expenses	40 661	32 245	27 557
Crop expenses	19 538	18 010	16 584
Depreciation (est.)	17 750	17 750	17 750
Net farm income	(2 321)	27 388	54 478
Off-farm income	16 786	17 585	24 702
Total family income	14 465	44 973	79 180

Source: Census of Agriculture and Census of Population, 1986.

TABLE 3 PROFILE OF LARGE GRAIN AND OILSEED FARMS (SALES $68 000 TO $212 000) IN ONTARIO, 1987

	Operating margin		
	Low	Medium	High
		(number)	
Farms	22	24	22
		(dollars)	
Gross cash receipts	116 424	$112 462	163 829
Crop sales	74 466	69 250	104 788
Total cash expenses	111 888	86 424	98 532
Interest	26 437	16 318	13 911
Depreciation (est.)	11 800	9 322	21 903
Net farm income	(7 264)	16 716	43 394
Off-farm income	11 132	7 212	1 438
Family income	3 868	23 928	44 832

Source: Survey carried out under contract for Agriculture Canada.

TABLE 4 PROFILE OF LARGE GRAIN AND OILSEED FARMS (SALES OF $87 235 TO $199 999) SASKATCHEWAN, 1988

	Operating margin		
	Low	Medium	High
		(number)	
Farms	21	23	21
		(acres)	
Farm size	1 087	1 013	1 115
		(dollars)	
Gross receipts	94 815	111 324	133 202
Crop sales	58 562	70 429	93 538
Government payments	21 633	28 410	19 469
Livestock sales	13 409	9 458	15 298
Other	1 211	3 027	4 897
Cash expenses	100 491	89 266	80 391
Interest	18 574	15 893	11 385
Other	81 917	73 373	69 006
Depreciation	17 916	20 218	19 339
Net farm income	(23 592)	1 840	33 472
Off-farm income	26 514	12 512	16 503
Family income	2 922	14 352	49 975

Source: Survey carried out under contract for Agriculture Canada.